Gas Journal

VOL. 276. 105TH YEAR. LONDON, DECEMBER 23, 1953. NO. 4725. PRICE 1/3

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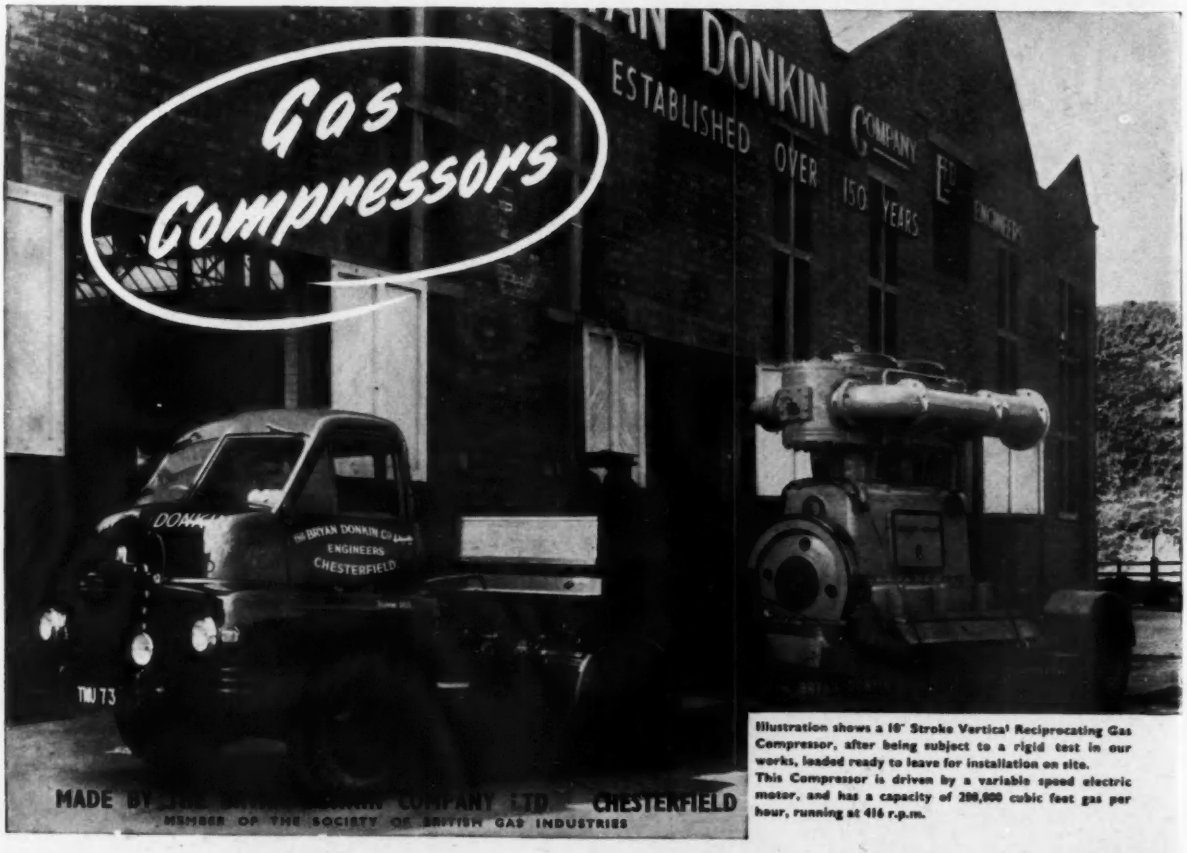
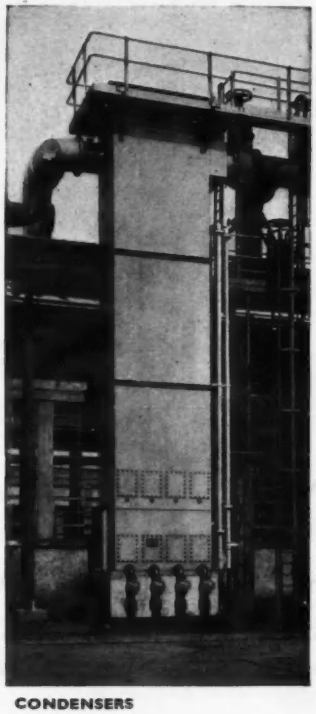


Illustration shows a 10" Stroke Vertical Reciprocating Gas Compressor, after being subject to a rigid test in our works, loaded ready to leave for installation on site. This Compressor is driven by a variable speed electric motor, and has a capacity of 200,000 cubic feet gas per hour, running at 416 r.p.m.

Seasonable Greetings and Good Wishes to all our friends, both old and new!



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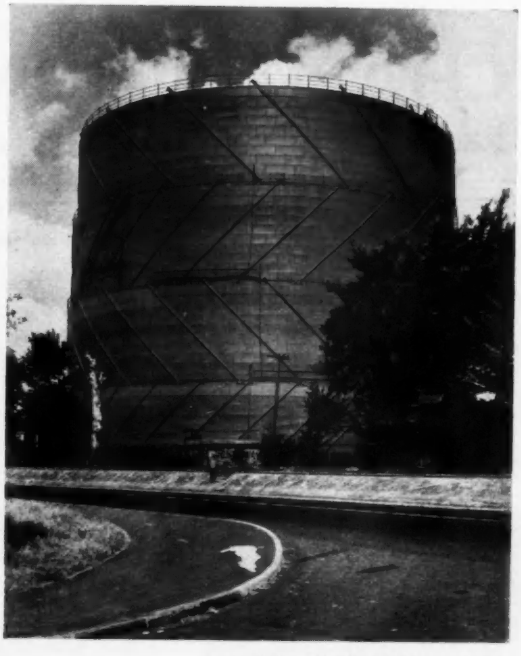

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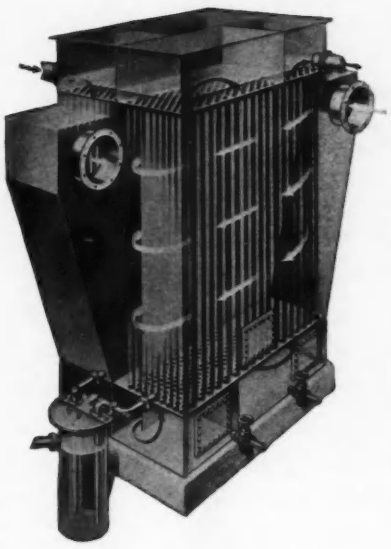
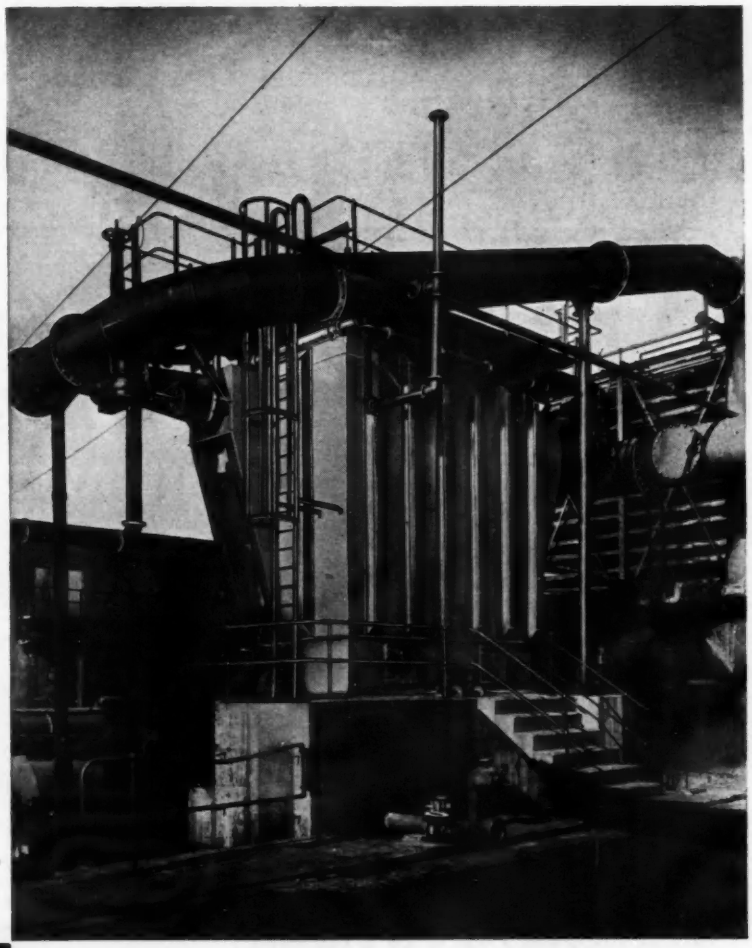


THE WHESSOE CROSS-FLOW CONDENSER

THE Whessoe Cross-Flow Condenser, a new and efficient unit for cooling gas, is now in operation. The first to be commissioned was built for Consett Iron Co. Ltd. Design capacity was 8.0 million cubic feet of Coke Oven Gas per day. Other units of this type have been supplied to Area Gas Boards.



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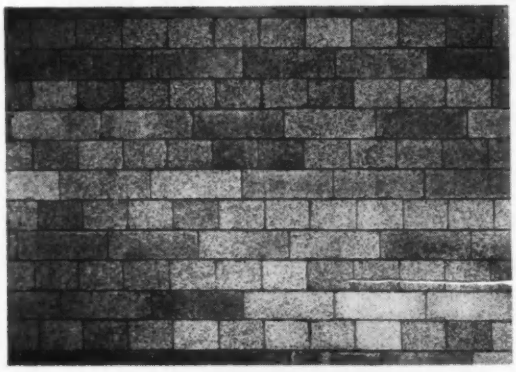

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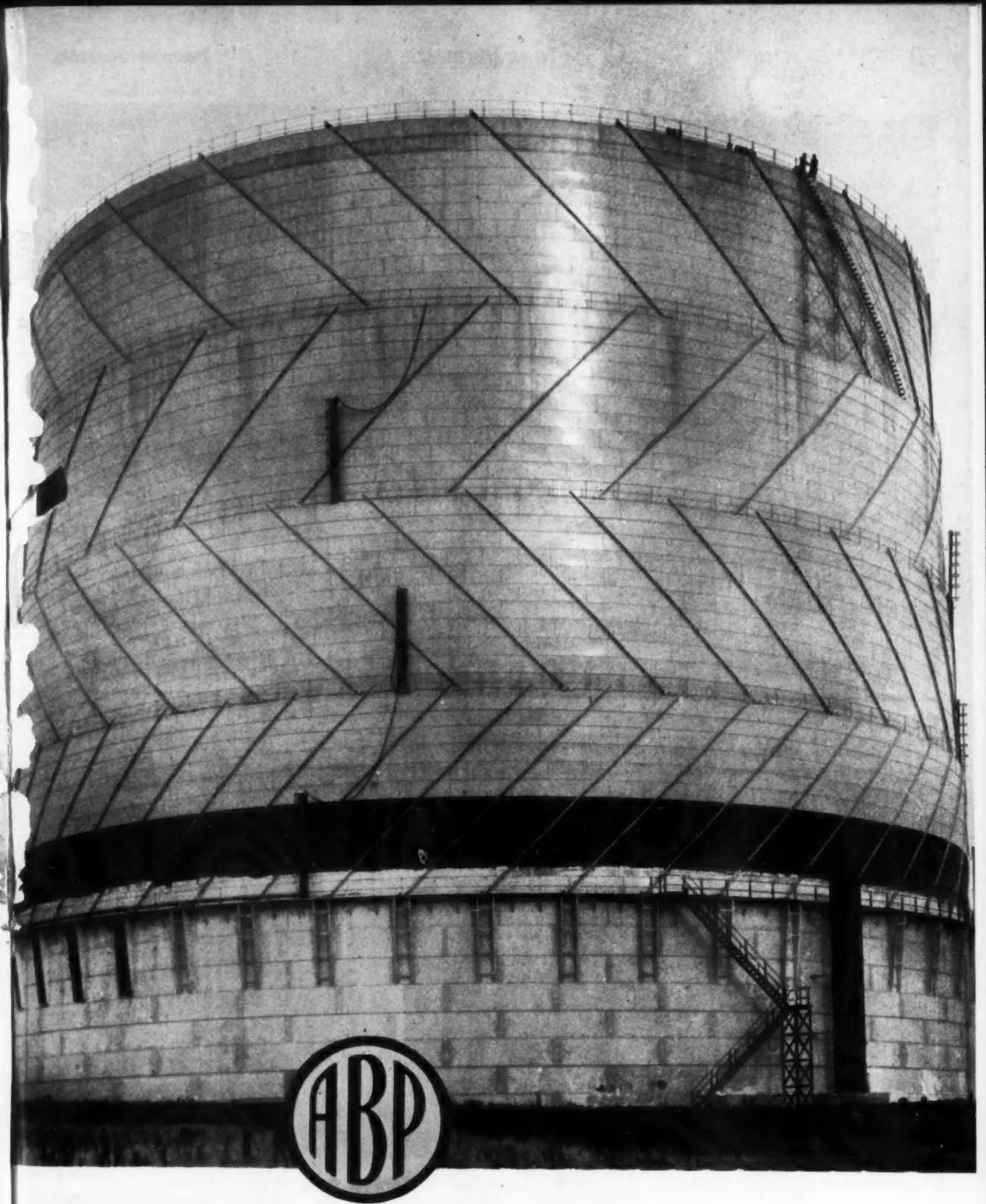

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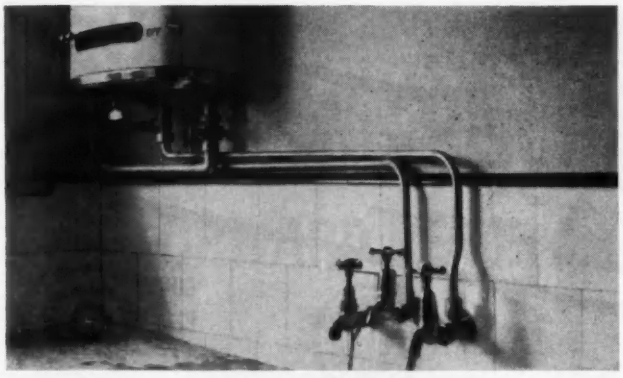

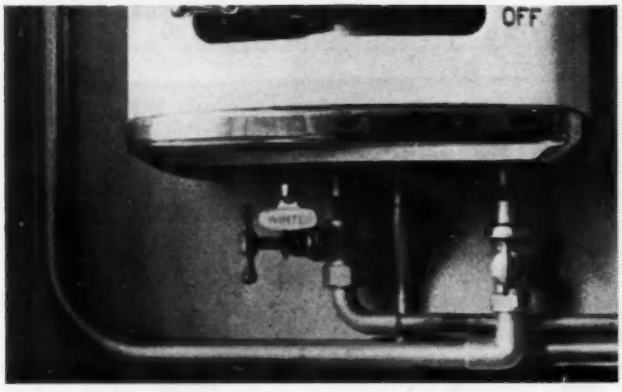

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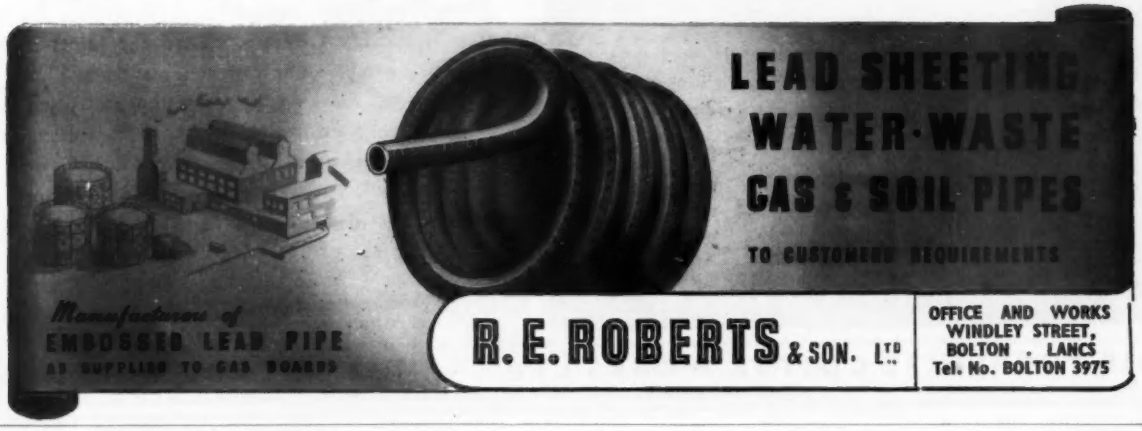

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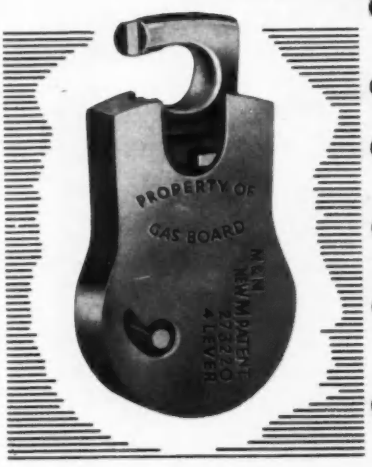

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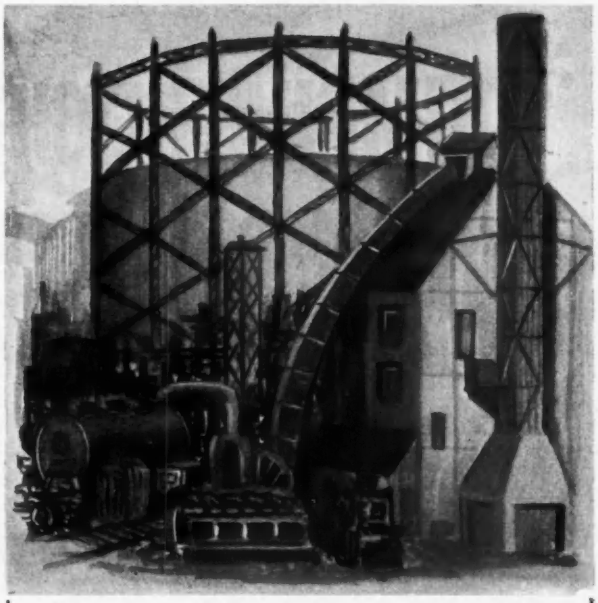

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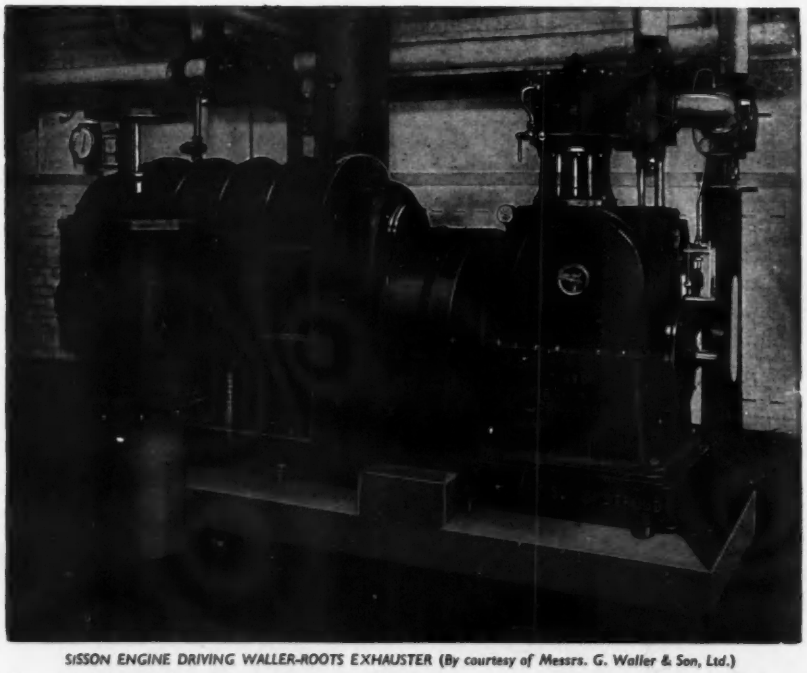

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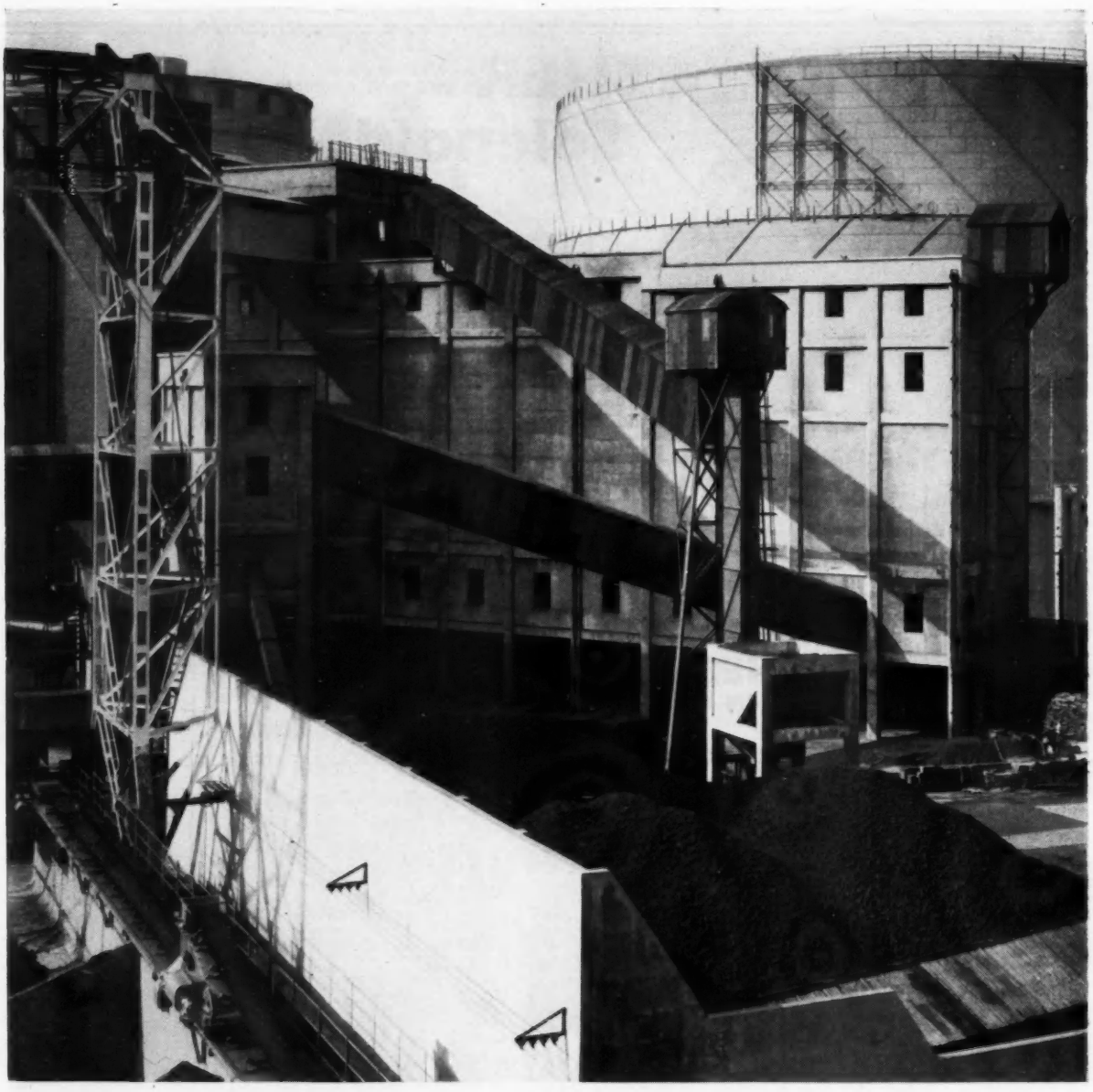

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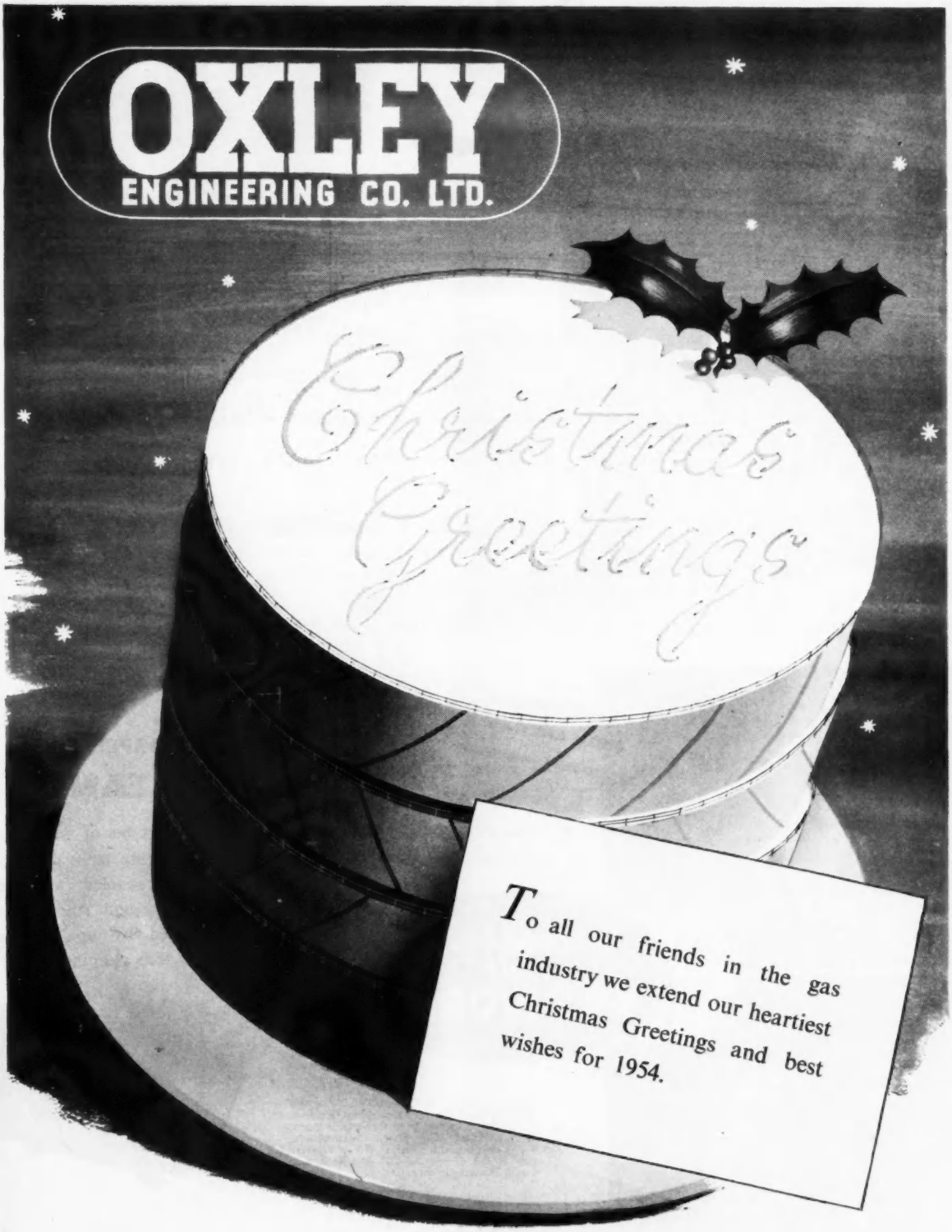
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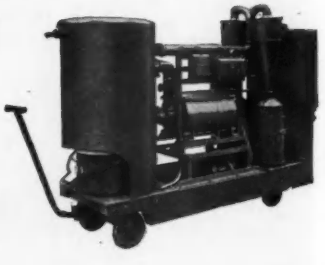

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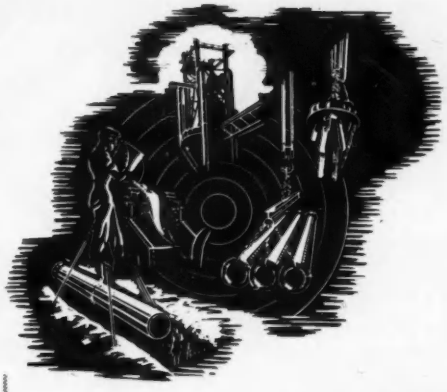

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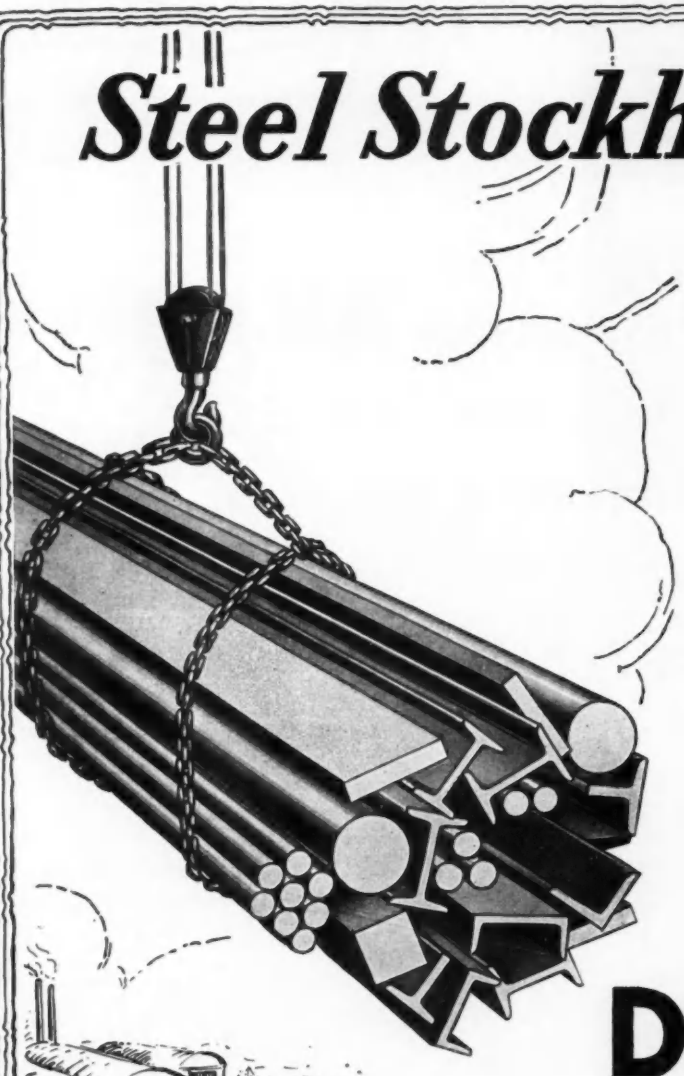

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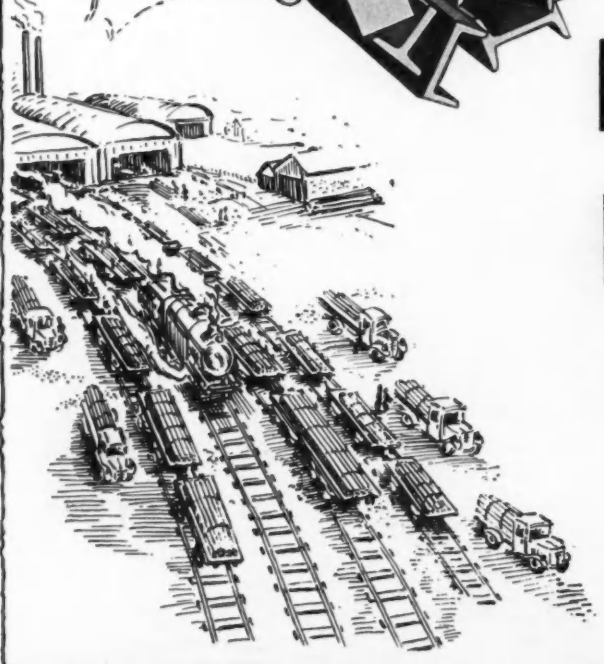

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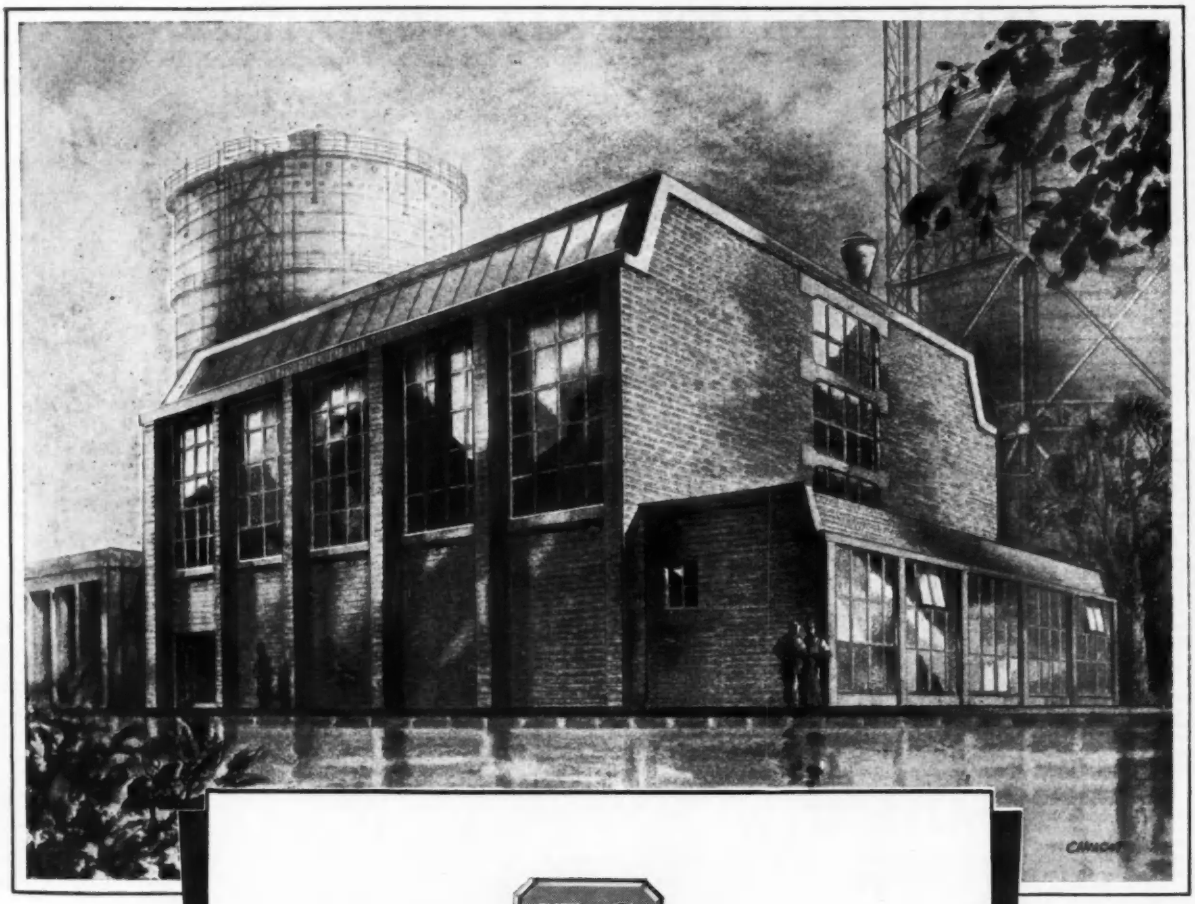

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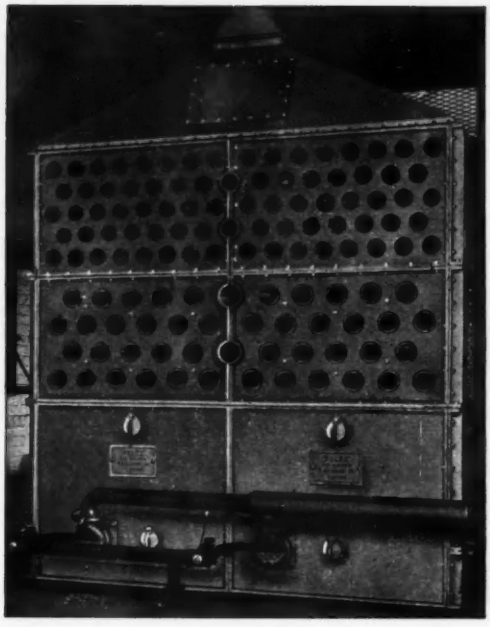

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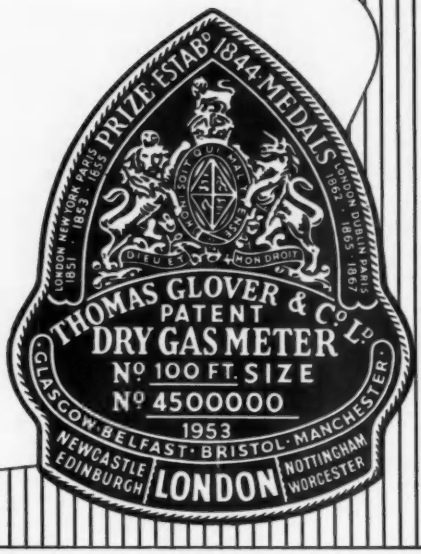
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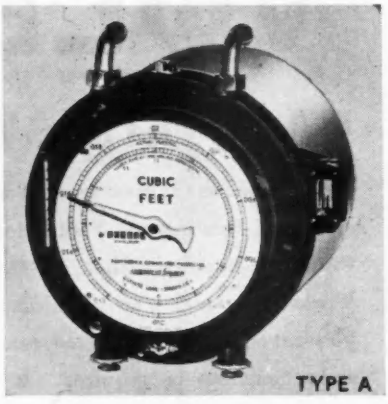

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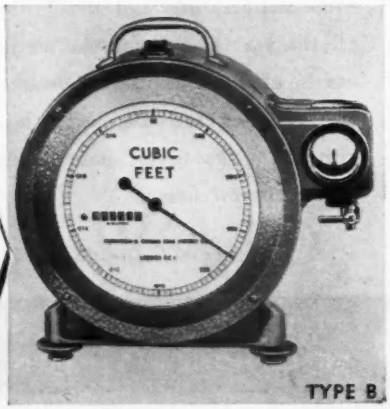

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GAS JOURNAL

VOL. 276. No. 4725 105TH YEAR December 23, 1953

A Happy Christmas To All Our Readers

THE TURNING POINT

Against the background of the general economic situation the reduction in the price of gas to over 40% of the consumers in the East Midlands may appear of small moment, but it is, in reality, far from unimportant. As Mr. Sydney Smith said in announcing his Board's decision at a special meeting of the Consultative Council, the action is of more than local significance. Its effects might well transcend the immediate and relatively modest benefit which will accrue to the 'above-average' domestic and certain non-domestic consumers, for it reverses the terrifying trend towards ever higher and higher prices. It indicates the attitude of an area gas board in regard to the need to check the rise in the cost of living. The East Midlands Board is not alone in this attitude. There can be no doubt that the gas industry as a whole is striving to achieve similar ends. Psychologically the East Midlands Board is in the happy position of making a New Year's gift of £160,000 to its consumers. Therein, of course, lies incentive.

The reduction in the Board's tariffs is a reminder of the greater degree of local financial independence and decentralisation in the gas industry in comparison with other nationalised fuel industries. The electricity boards, as the *Economist* has pointed out, have considerable financial independence but they buy the power they sell from the British Electricity Authority. The divisional coal boards are essentially units of management and administration. The gas boards, on the other hand, run their own businesses completely and merely make contributions to the central reserve and the current costs of the Gas Council. High profits in particular mining areas, as in individual mines, have to be applied to assist unprofitable districts and mines, and prices are determined at the centre. In the gas industry, the principle of broadly covering costs, taking one year with another, implies price averaging across an area, not the whole country, and local consumers can get the benefit of local efficiency. The simple answer to the question raised at the Nottingham Press conference on the price reduction as to why it was happening locally and not nationally is that the East Midlands were so placed in the handicap that they did in fact break the tape slightly ahead of the field.

There is no secret about the fact that the allowable changes in selling which come into practical effect on January 1, 1954, are designed to promote business. Mr. C. H. Chester told the South Western Consultative Council the other day that 55% of the domestic consumers in that area used less than 30 therms a quarter; 11% used only up to 10 therms a quarter and were definitely unremunerative to the Board and did not even pay for the cost of meter reading and collection, apart from other overheads. In the East Midlands 60% use no more than 30 therms per quarter, the average for all domestic consumers being 26 therms. It is deemed unlikely that the under-thirties would use more gas if the price was reduced, and to have spread the £160,000 price concession over all consumers would have produced so small an effect that any promotional outcome would be negligible. The position of users of water heaters (now free of hire-purchase restrictions), space heaters, gas pokers, drying cabinets, and hotplates is

different. Not only has the housewife often the choice of leaving her appliance unused but, particularly for space heating and water heating, she has a choice of other fuels. The use of these appliances will be much more dependent on the relative price of gas, and it is the prices of the second and third blocks of the domestic tariff which are relevant for this class of consumer. The new concessions will enable the Board's sales staff to give 'economy of fuel cost' a more important place in their sales campaigns, and the efforts to expand sales of water heaters will be strongly supported by an offer of cheaper gas.

It is when we come to the new load-factor discount of 10% on gas used by continuous-process firms, subject to certain conditions, that we see even clearer signs of the lifting of restrictions on promotional tariffs. A continuous load is defined as one in which gas is used at a reasonably constant hourly rate throughout each of the 168 hours of a seven-day working week, and the use of such gas is to be confined to a manufacturing process which itself may or may not be continuous. The figure of 10% is a fair reflection of the savings in costs brought about by loads of this type, for not only is there a saving in storage costs, but productive capacity is used to the best advantage. It is also felt that a 10% reduction in fuel costs will act as a strong stimulus to those who will qualify for the discount. Those most likely to qualify for the discount in the area of the East Midlands Gas Board will be, in the main, glass and pottery manufacturers. The total consumption of all the firms concerned in the area is approximately 6,250,000 therms a year, and the amount of revenue to be lost initially by the Board will be approximately £22,000 per annum.

Since vesting date the area boards, who desire beyond most things a reasonable period of stable prices, have had to meet increasing costs which have more than absorbed all the economies derived from improved operating results, integration, and other consequences of re-grouping. Even now there are premonitions of more demands outside their control, but without exception they are striving—obviously in this respect some boards are more fortunately placed *at the moment* than others—to bring prices down, at any rate to those consumers who are most likely to justify decreases. The Ridley Committee recommended that prices should reflect local differences in costs of supply. As integration proceeds it is possible to extend the territory over which the same price applies. Simplification of prices is proceeding on those lines.

TRIBUTE TO PIONEERING

George Edward Davis, who died 47 years ago at the age of 57, was a pioneer in the recovery of benzole, sulphate of ammonia, and cyanogen from coal and coke oven gas—in fact, he was the first to regard the gas industry as a real chemical industry and not just one kind of technology. Before he was 21 he was experimenting at Windsor and Eton gasworks in extracting benzole from coal gas, work which led to his appointment by Newton, Chambers & Co., Ltd., as gas manager at Rockingham works where, in 1884, he erected one of the first by-product plants for extraction of hydrocarbons and sulphate of ammonia. In the ensuing years he contributed much to the development of chemical engineering and was a founder member and first Hon. Secretary of the Society of Chemical Industry, as well as of the Sulphate of Ammonia Association (forerunner of the present Federation). He was the founder, in 1887, of our esteemed contemporary, the *Chemical Trade Journal*, which, like the 'GAS JOURNAL,' has remained the product of private enterprise as expressed by the small family company.

As a tribute to a pioneer, a George E. Davis Memorial Lecture was delivered recently by Mr. Norman Swindin, one of the few surviving links with the subject of his discourse, at a joint meeting of the North Western Branch of the Institution of Chemical Engineers and the Chemical Engineering Group and Manchester Section of the Society of Chemical Industry. Mr. Swindin was closely associated with Davis in the compilation of the second edition of his Handbook of Chemical Engineering, an intensely practical commonsense book which, alas, is now out of print and not easily accessible to the present-day student, who is taught mainly from American textbooks. The energy and versatility of 'G.E.D.' are reflected in the fact that up to 1890 he had taken out 34 patents, of which three dealt with improvements in the Leblanc soda process, nine with various aspects of gas industry by-products recovery, four with chlorine, five with sewage and water treatment, and three with sulphuric acid.

THE INDUSTRY AND LEEDS UNIVERSITY

The collaboration between the gas industry and Leeds University, visioned by Sir George Livesey and cemented by the outstanding work of men like Bone, Smithells, Cobb, and Townend, has already achieved highly significant results—and not only in the sphere of research. The work, animated by a spirit of adventure, goes on apace under the guidance of the present Livesey Professor, Dr. A. L. Roberts, whose report for 1951-52 of the Department of Coal Gas and Fuel Industries with Metallurgy (a designation which, we suggest, could to advantage be made briefer and more effective) is just to hand. In every respect the 1951-52 session was a good one. The number of applicants who eventually qualified for admission was again much in excess of the places available. Both undergraduate and post-graduate research schools were crowded to capacity. Accommodation problems remained acute. It was just possible to keep pace with demand—thanks to the ingenuity and cheerful co-operation of students and staff alike in adapting every inch of space to their needs. During the period, however, substantial reorganisation of the main fuel laboratories was started. And in the purchase of new apparatus the Department has been greatly helped by the endowment of £1,000 per annum made in 1951 by the Woodall-Duckham Company to commemorate the long and successful services of their former Chairman, Mr. F. B. Richards, who retired during that year.

In response to present-day trends and requirements, it is proposed to introduce additional training in industrial administration and management into the general fuel science degree course, which is primarily intended as a broad training for those entering the operational side of industry. Furthermore, it is now clear that greater integration between the fuel and gas engineering courses and the chemical engineering courses is needed and can be secured with advantage to both. It is intended for example, to install some semi-scale fuel plant, a step which has not been possible hitherto. Similarly, it is proposed to strengthen aspects of oil technology along lines of mutual importance to the fuel and chemical engineering sections. These developments are greatly to be welcomed.

Personal

MR. W. G. THOMAS has been elected to the Board of Radiovisor Parent. He is Managing Director of Bailey Meters and Controls and Chairman of the British Industrial Measuring and Control Apparatus Manufacturers' Association.

MR. D. H. DUIGNAN, Assistant Engineer and Manager at Spalding, has been appointed Deputy Engineer and Manager at Hinckley (West Midlands Gas Board). He is succeeded at Spalding by MR. H. C. ROBINSON, Assistant Engineer and Manager at Grantham.

MR. J. STANLEIGH TURNER has been appointed President of the Coal Utilisation Council for the fifth successive year. SIR JOHN CHARRINGTON has been re-elected Vice-President, and he, Mr. Turner, Sir William McGilvray, and Mr. H. V. Shelton confirmed as trustees for another year.

MAJOR J. B. CURRIER, Assistant Divisional Engineer, Leicester and Northants, only son of Mr. G. E. Currier, Deputy Chairman of the North Eastern Gas Board, was married at Hinckley on December 8 to Miss Barbara E. Swan, only daughter of Councillor C. Swan, a former chairman of the Hinckley Urban District Council.

MR. JOHN TERRACE (Chairman), MR. S. O. STEPHENSON and MR. ALFRED JONES have resigned from the Board of the Gas Purification & Chemical Co., Ltd., and the following Directors have been appointed:—MR. P. R. V. WHEELER (Chairman), MR. P. WHEELER, and MR. J. E. BARNARD. MR. E. MCCARTHY and MR. J. H. TAYLOR remain joint Managing Directors.

THE NATIONAL COAL BOARD announces that the following have agreed to assist in the Board's enquiry into its organisation: MR. H. A. BENSON, a partner in Cooper Brothers & Co.; DR. A. FLECK, Chairman of Imperial Chemical Industries, Ltd.; SIR WILLIAM LAWTHER, of the Trades Union Congress; SIR HERBERT MERRETT, Chairman of Powell Duffryn, Ltd.; and SIR GODFREY MITCHELL, Chairman of George Wimpey & Co., Ltd. The enquiry was announced by the Minister of Fuel and Power in the House of Commons on October 26.

MR. E. W. GANDERTON is to resign his Chairmanship of Stephenson Clarke Ltd., and Associated Coal & Wharf Companies Ltd. He will remain a director of Powell Duffryn Ltd. SIR HENRY WILSON SMITH who is at present Vice-Chairman of Stephenson Clarke, and a director of Associated Coal & Wharf Companies. has been appointed Chairman of both companies as from January 1. MR. F. C. ASGILL, a director of Stephenson Clarke, has been appointed Vice-Chairman of that company from the same date.

MR. GEORGE WOOD, C.B.E., who has been chairman of Thos. W. Ward, Ltd., Sheffield since 1950, retires from that office as from January 1, and has been appointed Vice-President. The new chairman will be MR. HAROLD W. SECKER, O.B.E., at present Joint Managing Director. MR. ARNOLD CARR, who was in charge of the Company's London operations prior to his return to Sheffield in 1950, has been appointed Assistant Managing Director. Also appointed to the Board is MR. RAWSON F. STAGG who, having been a local Director since 1947, now becomes a full Director.

MR. S. A. MOUSLEY, Sales Manager, has been appointed General Sales Manager of the general rubber goods division of the Dunlop Rubber Co., Ltd. MR. P. A. BRIDGE becomes Sales Manager of the mechanical group, and MR. A. B. RANKINE Sales Manager of the domestic group.

Obituary

J. W. NAPIER

We regret to record the death of MR. J. W. NAPIER, O.B.E., who retired in 1942 after 40 years' service to the Alloa Corporation as Gas Engineer and Manager. During the greater part of that time he engaged in widespread activity on behalf of the gas industry, and after retirement he preserved a considerable interest in a number of company undertakings, being, until nationalisation, chairman of several companies in Scotland. His career was, in fact, one of remarkable activity. He was President of the Waverley Association of Gas Managers in 1912, and of the North British Association in 1929. The annual meeting of the North British Association over which Mr. Napier presided at St. Andrews in 1929 was memorable for his vigorous advocacy of a change of name to the 'Institution of Gas Engineers of Scotland.' He personally moved a resolution to that effect and a very lively debate ended with the carrying of a motion that the name remain as before. Twenty-two years afterwards elapsed before the Waverley and North British Associations amalgamated in 1951 under the present title of the Scottish Association of Gas Managers. Mr. Napier's year of office was marked, too, by the presentation, as the President's memento, of a beautifully refashioned plaque of William Murdoch.

Mr. Napier received his early training under his father, Mr. Andrew Napier, at Crieff Gasworks. He was a student of the Heriot-Watt College, Edinburgh, and entered the shale oil industry. His first appointment as gas manager was at Auchterarder, where he remained from 1896 until 1899, and from there he went to Carnoustie. He was appointed to Alloa in 1902. In 1906 he was chairman of an informal meeting of gas managers and convenor of further informal meetings from 1912 until 1920. He originated the Scottish Gas Council—a forerunner of the National Gas Council—and held the position of Secretary of the Scottish Management Committee of the N.G.C. and of the Federation of Gas Employers, being also Secretary of the Scottish Tar Board and Hon. Secretary of the British Commercial Gas Association (Scotland).

In 1937 Mr. Napier was presented by the national gas organisations in Scotland with his portrait in oils 'in appreciation of services rendered as Hon. Secretary, 1919-1935.' He was a Fellow of the Chemical Society, a member of the Society of Chemical Industry, Member of the Institution of Chemical Engineers, and a Fellow of the Royal Society of Arts (Edinburgh). His services were eagerly sought in arbitration cases for transfers of gasworks to local authorities and investigations into schemes for gas supply in Scotland.

NEWS reached us as we went to press of the death on December 14 on MR. J. S. WILSON, Managing Director of Thomas Glover & Co., Ltd., at the age of 67.

Diary

Dec. 31.—NORTH THAMES G.C.C.: Westminster City Hall, Charing Cross Road, 2.30 p.m.

Dec. 31-Jan. 13.—SCHOOLBOYS' EXHIBITION, Horticultural Hall, Westminster, Gas Council exhibit.

Jan. 1.—INSTITUTION OF GAS ENGINEERS: Christmas Lecture for Juveniles, J. E. Davis, O.B.E., on 'The Movement of Gas,' Sir John Cass College, Jewry Street, Aldgate, E.C.3. 2.30 p.m.

Jan. 4-5.—INSTITUTION OF GAS ENGINEERS: Christmas Jubilee Lecture, Frank Brinsley. Bournemouth Technical College.

Jan. 5.—MIDLAND JUNIOR GAS ASSOCIATION: 'Gas Accounts and Finance.' R. L. Shaw (Dudley); Staff Mess Rooms, Council House, Birmingham.

Jan. 5.—EAST MIDLANDS G.C.C.: Meeting, Victoria Station Hotel, Nottingham, 11.30 a.m.

Jan. 5.—SOUTH EASTERN G.C.C.: Caxton Hall, Westminster, 11 a.m.

Jan. 9.—SCOTTISH JUNIORS (EASTERN): Short Paper Day at Dundee.

Jan. 9.—YORKSHIRE JUNIORS: 'The Training of Main and Service Layers,' R. H. O'Neill, Distribution Engineer, Huddersfield/Halifax Group, North Eastern Gas Board. Stratford Arms Hotel, Wakefield, 2.30 p.m.

Jan. 14.—MANCHESTER JUNIORS: Short Papers for the 'F. Johnstone' Prize.

Jan. 15.—SCOTTISH JUNIORS (WESTERN): 'Some Aspects of Consumer Service,' W. A. Green, Paisley.

Jan. 15.—LONDON JUNIORS: 'Gas to Crawley and other Distribution Problems in New Towns,' J. E. Steele, South Eastern Gas Board.

Jan. 18.—EASTERN G.C.C.: Connaught Rooms, Great Queen Street, Kingsway, W.C.2.

Jan. 19.—LONDON AND SOUTHERN SECTION, I.G.E.: 'Steam and Power at Bow Common,' A. F. Grant, North Thames Gas Board.

Jan. 20.—YORKSHIRE JUNIORS: 'Review of Town Gas Production,' A. F. Cottrell and T. W. Austen, Woodall-Duckham Construction Co., Ltd. At Bridge Street, Leeds.

The offices of the 'Gas Journal' and 'Gas Service' will be closed for the Christmas holidays from Thursday afternoon, December 24, until Tuesday morning, December 29

International Kitchen

LEADING cooks of 20 countries will again demonstrate their ideas of how ingredients available to the British housewife can be made appetising by using the traditional recipes of their countries, in a second edition of 'International Kitchen.' The success of the Gas Council's exhibition of International Cookery in November, 1952, resulted in requests for another edition which would run over a longer period to enable more people to see it. The second 'International Kitchen' will be presented at the British Food Fair in September, 1954.

The Gas Council exhibit will occupy a premier position in the Grand Hall at Olympia, and 20 kitchens will be erected there, in which demonstrators will prepare and cook the most famous dishes of their countries.

THE SMUGGLERS' INN TRANSFORMED

Gas Helps to Modernise a Famous Dawlish Hostelry

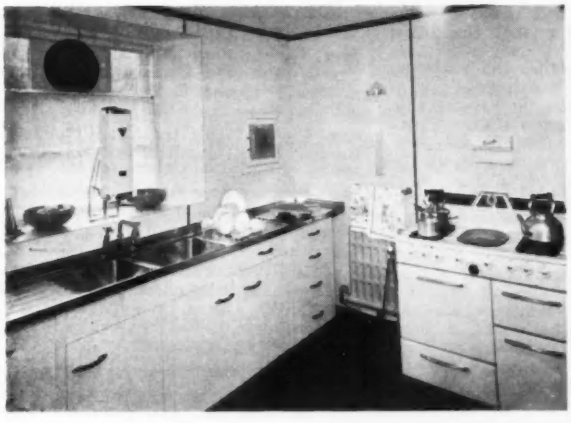
The Smugglers' Inn, Dawlish, South Devon, owned by Mr. E. Leslie Angel, is a unique example of how a small antiquated country inn can be transformed into one of the most famous road houses in the country.

By excavating some ground which adjoined the building and by the re-construction of a number of rooms a Continental-type terrace was formed with an accompanying bar. This enabled the Proprietor to provide his patrons with the facilities for the enjoyment of liquid refreshments in the open air as he furnished the terrace with gay tables and chairs.

On the other side of the building was evolved the 'Wonder Bar of the West,' as it is popularly known. It is claimed to be the longest bar of any inn in the West country, and this was made possible by the removal of the dividing walls of five rooms, re-constructing the whole section, to provide maximum comfort and enjoyment in this artistically designed bar.

During the war years the inn gained an international reputation. An article on it appeared in the *Worlds Press News* in May, 1941, and in the *Singapore Free Press* on December 9, 1946, in which was published a photograph of the bar—just one more indication of its world-wide fame. Wherever one goes in England, the mention of Dawlish brings the inevitable question, 'Do you know the Smugglers' Inn?' Thousands of people come specially every year to see this famous hostelry.

Gas appliances contribute to the efficiency and comfort of the inn. Among those installed by the South Western Gas Board (Southern Division) are two 7907 Radiation 'Tewkesbury' fires, two 5707 Radiation 'Stoneleigh' inset fires, a 2-unit Bratt Colbran 'Lutello' panel fire, a 2-unit Bratt Colbran "Rayello' panel fire, a 503/1 sink Ascot water heater, a Ascot SG32/1 water heater, and a 3518 Radiation 'New World' range.



For some 18 months courses of lectures on the handling of materials have been given by a team of lecturers in many parts of this country, who have for years past specialised in this important branch of production technology. It was realised, from the start, that these courses were but a palliative to more advanced and prolonged studies, and steps have now been taken to provide more advanced and detailed courses. To do this it has been necessary to take over larger premises and an estate of some 17 acres has been procured to develop this educational work still further. The names of College of Production Technology and School of Work Study have, in addition to School of Materials Handling, been officially approved by the authorities. This educational work is now being carried on under the title 'College of Production Technology incorporating School of Materials Handling and School of Work Study.' The Panel comprises men of both practical and theoretical experience. An advisory service has been set up and is at the disposal of the whole of industry. To those taking courses of study, the service is free, but a small charge, depending on the size of the problem, is otherwise made to help support the educational work of the college.

Further details may be obtained from the College Secretary, Swinford Old Manor, near Ashford, Kent.

Production-Engineering, Ltd., 28, Bruton Street, London, W.1, have produced a brochure which describes the courses in 'Work Study and Management' which they are holding in London. Since the war it has been recognised that work study can be of great value to many industries and businesses in that it can reduce costs and increase production. Furthermore, it can do this without the heavy capital expense needed for re-equipment with new plant. There has therefore grown up a demand for the training, not only of the engineers who are to apply work study techniques, but also of the management staff who are to supervise it and to use its results for the more effective control of the business. To meet this demand the firm decided some months ago to develop the training courses which they were already conducting for their own consulting staff and to open them to members of outside firms who are considering the use of work study. The training is given by senior members of the firm's staff who are currently applying these methods in industry, and it is therefore firmly founded on practical experience. The course lasts for 3½ weeks. It gives a grounding in time and motion study, and a training in the use of these techniques by Management; it also gives background training in self-expression and clear thinking. The first three courses in 1954 will start on January 18, February 15, and March 15.

SHIPS OF THE NORTH THAMES GAS BOARD

Two New 4,600 Tonners Launched—A Maiden Voyage—Two old Vessels Sold

Mrs. Michael Milne-Watson, who performed the naming ceremony at Aberdeen, with her husband, the Chairman of the North Thames Gas Board.

Two new ships for the North Thames Gas Board were launched last month; another launched last July completed her maiden voyage, and two older vessels have been sold. The 4,600 tons steam collier *Frederick John Evans*, the second of three vessels on order for the Board, was launched on November 6 at the yard of S. P. Austin & Son, Ltd., Sunderland. The naming ceremony was performed by Mrs. Dillon, wife of Mr. G. D. Dillon, a member of the Board. The vessel is 344 ft. in length, and is fitted with four holds, each with self-trimming hatchways. Navigating aids will include radar and echo-sounding equipment. The propelling machinery for a service speed of 10½ knots will consist of a direct-acting, triple-expansion engine of re-heat design. Steam will be provided by two three-furnace boilers to burn fuel oil under the Howden system of forced draught with pre-heated air supply.

The third of these three vessels, the *Sir David II* was launched on November 20 in Aberdeen at the shipyards of Hall Russell & Co. Mrs. Michael Milne-Watson, wife of the Chairman of the North Thames Gas Board, performed the naming ceremony. This vessel will also carry 4,600 tons of coal, is 339 ft. overall length, and is of a single screw, self-trimming type. She has four holds suitable for grab discharge served by hatchways fitted with steel covers of combined rolling and pivoting type. The propelling machinery of 1,275 service i.h.p. is to be fitted aft, and will consist of a direct-acting triple-expansion engine of re-heat design to operate at 220 lb. per sq. in. on superheated steam generated in two oil-fired cylindrical boilers fitted with forced-draught equipment.

On both ships, accommodation is provided for all members of the crew in single-berth cabins. Well-equipped laundries for the crew's use are fitted aft.

The latest collier to come into service with the Board is the m.v. *Thomas Livesey* which completed her maiden voyage last month when she docked at Fulham gasworks with 2,700 tons of coal. She was met by Mr. L. C. Hansen (member of the Board) and his wife who performed the naming ceremony at Sunderland in July. They were shown over the ship by its commander, Captain G. Colvin, and before leaving Mrs. Hansen presented a musical cigarette box to the ship's crew.

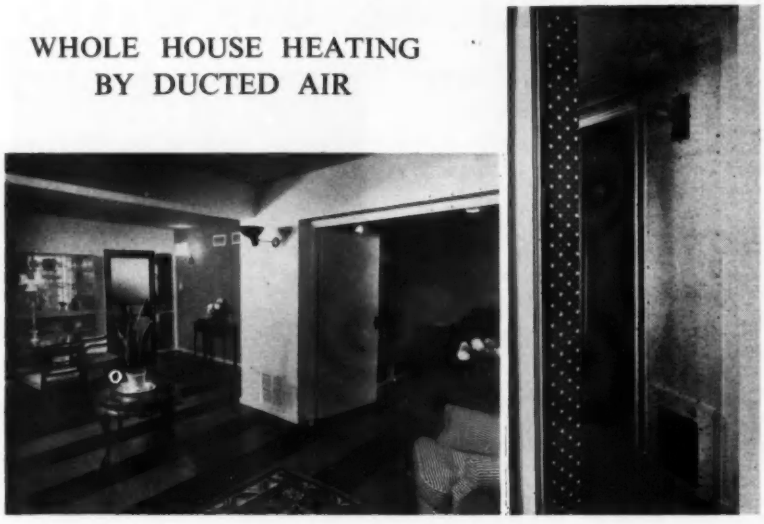
Mrs. G. D. Dillon, accompanied by Mr. Dillon, a member of the North Thames Gas Board, named the 'Frederick John Evans' at the Sunderland launching ceremony.

Ethylene, one of the Board's older 'above-bridges' colliers, has been sold to Hargreaves Coal & Shipping Co. of Leeds. She had more than 32 years of service, making 1,522 round trips from the North East coast bringing 1¼ mill. tons of coal. In addition she made 32 voyages to the Continent to bring back bog ore. Her new owners have renamed her *Harfrey*.

Afterglow, built in 1920 has made well over 1,500 round trips, bringing approximately 2 mill. tons of coal to London. She has been sold to the British Iron and Steel Corporation, and will be broken up on Tyneside.

The new 'Sir David II' immediately after the launching.

WHOLE HOUSE HEATING BY DUCTED AIR



On the right is the gas operated heating unit which is placed unobtrusively in the passage dividing the bedroom and bathroom. On the left is the lounge and music room, in which can be seen the main warm air registers at low level and the high level return air grilles.

WE have described fully in the 'JOURNAL' the 'whole-house' warming system developed by Radiation Ltd. This smokeless system can be installed with a smokeless gas-burning chimney furnace or a smoke-consuming downdraught furnace which burns any household solid fuel. The units we have described were installed in houses at Stanmore, and at the time (April 6, 1949) we suggested, quite rightly in the event, that the work of Radiation in this regard constituted an imaginative social service. The system facilitates the 'free' or 'open' plan of dwelling design, though it is equally suitable for the more conventional type of house. It has been applied with notable success by the London County Council in 'middle income group' houses, and it has also been installed in flats, shops, and public buildings.

We may recall that the solid fuel installation will heat an entire house of approximately 1,000 sq. ft. floor area on an average fuel consumption of four tons. At the same time it will provide a constant and generous supply of hot water for all domestic needs. The gas installation will provide the same standard of room heating on an annual consumption of 600 therms of gas. Constant hot water can be supplied by a Radiation New World gas circulator on an average annual consumption of 250 therms of gas, or by a Radiation coke boiler.

The latest installation we have inspected is at new flats in Cardigan Road, Richmond. In this case the gas unit was chosen and the flats were specially designed to exploit the advantages of warm air heating. The unit is installed in the centre of the flat and the air is circulated through a sub-floor under the bathroom to the various rooms. The ducting is thus reduced to a minimum and the whole installation is unobtrusive. The system is entirely automatic and has an efficiency of 75%. The only operation needed is to set the room thermostat to give the desired temperature. If required, each room can be maintained at full comfort temperature. Alternatively, the bedrooms can be maintained at lower temperatures by the simple operation of a damper.

HOME LAUNDRY

A SERIES of home laundry demonstrations was held recently in the demonstration theatre of the Paisley showrooms of the Scottish Gas Board, and each session was well attended. An open invitation was extended to all housewives interested in labour saving appliances, and individual invitations were sent to owners of gas washing machines in the district. It was felt that the presence of owners of machines would add weight to the case presented by the demonstrator, Miss Jean McInnes, the Paisley District home service adviser.

A live display in the showroom window showed, by means of an overhead mirror and coloured balloons, the method of agitation in the gas washing machine.

When the official part of the demonstrations was completed each day, the success of the idea was most apparent, the audience, of its own volition, breaking up into small groups of friends and acquaintances, under the guidance of some of these satisfied users, who supported the claims made by Miss McInnes, drawing on their personal experience, and praising the contribution of gas, and the machine, as the solution to the problem of home laundry.

He Can Still Smile

Congratulations to 'SEGAS,' the journal of the South Eastern Gas Board, on the cover of its Christmas Number. Our reproduction does not do justice to the jolly multicolour original, but even from the black and white it is clear (a) that Mr. Therm has forgotten smog and is even a trifle smug over (b) a perfectly cooked turkey and (c) is about to receive a favour from a uniquely tidy housewife.

Stewarts and Lloyds' Jubilee

THOSE with a keen historical sense are fortunate to be living in the era of a world rapidly approaching a climax of either self-destruction or exalted construction. In other words they may set their own lives against a background of contemporary events that are an important part of world destiny.

To celebrate their 50th anniversary, Stewarts & Lloyds, Ltd., have produced a special annual review that is more than a mere record of achievement; rather it is a history within history—a biography showing the effect of events on the company and the effect of the company on events.

In 1903, the name of A. & J. Stewart & Menzies Ltd. was changed to Stewarts & Lloyds Ltd., on the acquisition of Lloyd & Lloyd Ltd., and its subsidiary, Clydeside Tube Co., Ltd. The review manages to emphasise that Stewarts & Lloyds built upon the traditions of those concerns.

The union of the firms under the chairmanship of Mr. John Graham Stewart brought under one control manufacturing plant capable of dealing with all classes of tubes from the smallest sizes up to 6 ft. in diameter. It also meant, among other benefits, the pooling of technical information and the allocation of orders to plants best suited to deal with them. Immediately after the amalgamation it was decided to float a subsidiary company—under the name of Stewarts & Lloyds (South Africa) Limited.

One effect of the amalgamation in 1903 was that both companies—A. & J. Stewart & Menzies and Lloyd & Lloyd—found themselves each with their own agents or branches in foreign countries. A general review was made of all overseas markets, and for administration purposes each was placed under the control of either Glasgow or Birmingham.

The year 1919 was the beginning of a period of abnormal demand for steel tubes of all classes, which was later—as markets were supplied with their immediate needs—succeeded by a return of the fierce competition of pre-war years. The book describes the years 1919-1929 as the years of consolidation. Under the chairmanship of Mr. John Graham Stewart, who died in 1925, the Company made remarkable progress. He inherited a tube output of some 42,000 tons; when he died, annual production of the greatly extended organisation had been increased to somewhere between 200,000 and 250,000 tons.

The years of expansion for the Company were 1930 until August, 1939. This period will long be remembered for the 'depression' and the rise of Hitler and his subsidised German competition. But the 30's were also memorable for the development of Corby and the successive acquisition of a number of large competitive concerns by the Company. At no other time in its history had its expansion been so large or so rapid.

In the second world war 200 S. & L. employees were killed out of the 5,300 who served in uniform. Despite bombing, 'alerts,' and the numerous difficulties of the time, the Company maintained and increased its production. Its products, essential to peace-time economy, were vital also in war. And, during those six years, the Company was destined to make a contribution to the war effort that was far in excess of—and additional to—its responsibilities for steel and tube production. The Company became agents for the Government for the manufacture of shells. It was also instrumental in the construction of 'Pluto,' the pipe line system that linked the 1,000 miles of pipe-line network already installed in England with the Continental pipe-lines that followed the advances of the Allied armies after D-Day.

In dealing with the recent years, the review states the importance of the 20 years' chairmanship of Sir Alan MacDiarmid. Sir Allan took office in 1925 at a time when, through the over-valuation of the pound, Britain had returned to the gold-standard—to the serious detriment of the export trade. The subsequent depression of the late 1920's and early 30's was all too quickly followed by the onslaught of Hitler's war. The tremendous growth and progress of the Company during his period as chairman were very largely due to his initiative and guidance. His Knighthood was conferred in 1944. He died in 1945.

One of the reasons for the Company's increased expansion in post-war years has been the tremendously heavy demand for screwed and socketed tubes, a demand reflected from the rising standard of living which has resulted in a general extension of the use of gas and water pipes throughout the world.

The review gives a comprehensive résumé of Stewarts & Lloyds' expansions and improvements; it is an impressive pictorial production, typographically excellent and lucidly written. Above all, it is obviously the work of a Company which, after 50 years of existence, is proud of its part in industry and aware of its importance in contemporary life.

RESEARCH

Here we continue from p. 729, Dec. 16, the series of articles by 'Gas Journal' Observers who attended the various sessions of the RESEARCH MEETING of the INSTITUTION OF GAS ENGINEERS.

Composition of Tar

Probably the real intent of the paper by Dr. D. McNeil and Mr. G. A. Vaughan on the 'Composition of Coal Tars' was to set out a standard method of tar analysis so that results in future may be comparable. 'Since, in many cases,' they say, 'the nature of the coal and the exact conditions of carbonisation are not specified . . . a comparison of the results so far available leads to no valuable conclusion.' It is to be feared that the same defect characterises the 12 tests reported in the paper. In only one case is the coal fairly completely specified; in perhaps two or three others it is partly specified; the rest are mixtures. Shall we get anywhere with this? In a conversation we had with a tar distiller of long experience we found that what he was looking for was quite a lot. He would like to see 1,000 tons of each of the standard coals, each coal separately carbonised in each of the main systems, continuous vertical retorts, horizontal retorts, and coke ovens, and the resultant tars fully analysed. The remark was no doubt more than semi-facetious. He knew as we do that nothing like this is going to be practicable. But something could be done to secure a selection of tar samples from plants carbonising mixtures of similar coals. They could be carefully sampled and analysed; and analyses of the gas made with details of carbonising conditions would no doubt also be useful. It may well be that these 12 tests will serve as a guide to the chemical composition of other tars. Certainly the admirable description of the technique for assay will be immensely valuable. But the phrase 'same types of coal' seems curiously irrelevant, because in the main these are not types of coal at all. And it is not, we submit, surprising that no very definite relationships between the several components and properties were discovered.

But that does not detract from the interest with which these test results will be studied. Dr. McNeil's presentation of the paper was also very interesting. Tar is to be looked upon as a natural product of the carbonising process. It is not to be expected that, in the long run, carbonising systems will be intentionally modified to any significant extent to influence the properties of the tars produced, however much these properties may be claimed as collateral advantages of this or that system. This fact comes out in the classifications of tar which have been proposed from time to time. Is the gas industry very wrong in classifying its tars under headings descriptive of the carbonising systems in which they are produced, continuous vertical retorts, intermittent vertical retorts, horizontal retorts, and coke ovens? As suggested above, such a classification would need to be sub-divided under headings taking into account the type of coal used. But it would seem to run parallel with such classifications as what we understand to be the Blackley classification, that of specific gravity, running from low for continuous vertical retorts and going progressively higher to coke ovens.

Incidentally, it may be said, as indeed Mr. Blundell suggested during the discussion, that the tar distiller is

most pleased when he can get a run-of-tar of more or less constant properties. And it is not surprising that he does get this when his supplies come from a large number of continuous verticals carbonising roughly the same range of coals and steaming to about the same extent. It is not yet known by a long way how any changes over a limited range (as they generally would be) in these two conditions would affect the properties of the tar. It is interesting to note that Mr. Fuidge finds that, whereas the tars from continuous verticals are very consistent, those from different horizontal retort installations show large differences in composition. It is obvious that carbonising conditions vary throughout the cycle, but not so obvious why the differences do not cancel out over a longer period of time. In the meantime the tar distiller must accept whatever tars are sent to him, make a distillation assay in his laboratory, and blend to get as much as possible of such products as he can find a market for.

'The most potent factor,' said Dr. McNeil in his illuminating reply to the discussion, 'in causing changes in the chemical composition (of the tar) is contact time, the time during which the initial products of carbonisation exist in the hot coke bed.' It is precisely this factor which is practically constant in the continuous vertical.

Another classification is based on aromatic content. From this point of view, the temperature of the contact zone seems to be of importance. Indeed, a rough classification is that of high temperature and low temperature tars. Continuous vertical tar comes under the latter heading since the temperature in the top of the retort is kept relatively low by the incoming charge of cold coal and the presence of undecomposed steam. Of the latter again, the higher the steaming rate the greater the quantity of undecomposed steam and the lower the temperature. 'You ultimately reach the highest aromatic content in coke oven tars.' Dr. McNeil went on to remark that the phrase 'free carbon content' is something of a misnomer; he prefers, and the tar distillers agree with him, the phrase 'toluene-soluble matter,' a better criterion, too, of the amount of cracking which the tar has undergone.

The tar distiller is confronted with many problems. Creosote is, we are told, again a drug on the market. America is not taking so much for wood preservation, and hydrogenation appears to have come to a standstill. There is the problem of producing a non-toxic road tar—a problem which may be reduced by washing with caustic soda.

If, however, the paper is a little disappointing from the practical point of view, it did realise the President's ambition. It presented views of those outside the gas industry on a subject with which the industry is directly concerned so that we can get another angle from which to look at our problems afresh.

Cooking and its Results

MUCH has been written about cooking, the art of manipulating a 'guinea-fowl à the dollar' (somewhat mixed, but *vide* luncheon menus). Much has in fact been written by Mr. E. W. B. Dunning on this subject; and though he has concentrated (for obvious reasons) on the application of gas to the bath-bun, the loin chop, and the Dundee cake, he has certainly attacked the subject generally. We have published, page after page after page, his findings in this limited sphere of research. Admittedly we have not provided with each 'Dunning issue' a set of thermo-couples to stick into rock-cakes, raw beef, or blancmange; we have, however, provided a great deal of printers' ink, paper, and time to giving Mr. Dunning his cooking-due. That is why we were so surprised that, in presenting his paper on 'Heat Transfer and the Cooking Process,' he should deliberately go out of his way to say that little has been published about gas cooking in the Gas Press. His paper included a wealth of literature references, several of them being '*ibid*,' whatever that means, but referring to the 'GAS JOURNAL,' however obliquely. And we note—we confess, with some surprise—no pointer to the classic work of Dr. Harold Hartley on the subject of cooking by gas. Maybe this was included in '*ibid*,' which springs like the release of a whirr of mosquitoes at the end of Mr. Dunning's paper.

No-one, we think, can have devoted more time to the application of science to cooking by gas than has Mr. Dunning. He has spent years on the subject, bringing to bear on it scientific technique and also imagination. He has inspired at Watson House a remarkable group of sniffers and tasters, trained *via* the university or the kitchen, sharp to detect and strong to remedy. It has been our privilege to see this vast bun-making, meat-roasting organisation in its working stride; and it has proved a fascinating experience. On occasion, being ballet-trained, we have tripped so lightly over the electric circuits that we have spoilt no contacts with the thermo-couples, the while being rewarded with a hot bun. Let it be said at once that this Watson House cookery is no flash in the frying-pan. It has been going on for years, and it is in the deserving cause of exquisite eating —by gas (and coke).

With delicate humour, Mr. Dunning, presenting his paper, said that the proof of the pudding was in the eating. We think all will share in the sentiment of this merry quip—at the moment in particular, when we hail Christmas, 1953. And this makes us reflect on one or two factors influencing cooking. Cooking appreciation depends largely on the state of the eater's palate—in other words, the condition of the consumer's tongue. We feel certain that a 'good meal' implies so much more than can be taken-in from the sandwich-snack of the No. 12 Blue Book of the Gas Council—so much more than can conveniently be disposed-of by expert discussion such as took place on November 25 last. For example (and without reference to '*ibid*'), some of the most delightful meals to which we have been asked to give a knife and fork have been cooked without thermostatic control—and they have not been cooked by gas. Slow cooking by oil or solid fuel has something to recommend it. Swift and sure high-temperature radiation has also much to recommend it. Science has its place in cooking. Additionally, there is the art of 'mealsmanship.' It is an art which we think offers great scope. In adding science to gastronomic enjoyment, Mr. Dunning and his co-workers are not only guaranteed a living; they richly deserve the compliments of the gourmet.

Why was Mother's Cooking Best?

But let us get down to Mr. Dunning's paper, rather than contemplate what can be cooked, for example, on a spit, without coal gas or butane, or ruminate on appetite-whetters which bring-out flavours, aid digestion, or spell early demise. And so, to use a vulgar and incorrect phrase, to our muttons and mint sauce. The purpose of research, said Mr. Dunning at Church House, is 'to enable appliances to be designed to have the traditional good standard of cooking with increased speed, greater ease in obtaining a good result, greater nutritional value of the cooked food, and economy of fuel.' A noble thought; a worthy ambition. Cooking has been evolved by trial and error. Today, most of the world lives in a post-cannibal era. What we have to do, it seems, is to find out why mother's cooking was best. And then we should, even at this stage, ask whose mother was responsible for the cakes made so sad in the absence of the thermo-couple and the photo-electric eye.

Mother's reasons, argued Mr. Dunning, if they can be scientifically ascertained and analysed, should lead to improved appliance design; and there is always 'the out-

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side chance of some important discovery.' The food manufacturer can most easily use a new technique if it can be introduced, but this would have to be very simple to be operated by the housewife. Mr. Dunning seems to have no high opinion of the newly-wed or the bride-to-be. The simpler, the better. Heat transfer in the steady state by conduction, convection, and radiation, is familiar to us from our school-days. Unfortunately, as the author pointed out, heat flow does not often occur in the steady state. In the unsteady state it becomes more complicated; and when physical and chemical changes occur at the same time, as in the boiling of potatoes, the problem becomes even more complex. Theory becomes more difficult; theoretical treatment becomes almost impossible when dealing with bread or cakes. We agree heartily.

'*Skin Formation*,' *even in Cooking*

The author gave a diagram showing the various stages in the cooking process with the different methods of cooking grouped according to the heat transfer methods used. Clearly, oven cooking is the most complicated. The paper then went on to deal with the transfer of heat to the surface of the food, the conduction of heat from the surface into the interior, and, finally, the changes which take place within the food itself. Experimental results were given of the surface resistance to heat flow in cooking potatoes in various ways. The resistances in boiling and steaming, either normally or in a pressure cooker, are similar. With frying and baking, much higher resistances are set-up due to the skin formation, although these are partly offset by the higher temperatures used in these cooking processes.

Cooking scones under a gas-fired radiant panel, or in an upward stream of hot air, so as to vary the proportion of radiation and convection, did not show any marked difference from those from a normal gas oven, but none of the results was as good as with 'normal' cooking.

Heat conduction theory has suggested useful lines of research which are to be carried out, covering different shapes and dimensions, as well as the determination of the thermal diffusivity of different foods, both cooked and uncooked. Obviously, there is a changing condition all the time. The temperature gradient from the hot fluid to the food interior is shown diagrammatically in the paper. Mr. Dunning drew attention to the surface film of fluid adjacent to the food surface and the crust or skin layer which forms on the surface of the food being cooked. Even at the end of the cooking process the temperature seldom gets higher than the boiling point of water, and with the cooking of '*a substance such as meat*' (what a delightful description!) a temperature of 160°F. is much more usual.

The results of an attempt to assess the rate of cooking at various temperatures, without the complication of conduction, are given. The speed of cooking increases rapidly as the temperature is increased. This is the main reason for the speed of the pressure cooker, especially for small pieces of food, such as sliced carrots or peas. Increase in speed is less marked when larger pieces are cooked, as with 'cylinders' of potato.

Very Tasty

How shall we judge cooking? Physical tests can be helpful. 'Assessment by the senses of sight, smell, and taste is complicated by the different sensitivities of individuals,' said Mr. Dunning. How right he is. Certain 'children's party trifles,' for example, have to our knowledge been frowned upon by a well-meaning older generation, intolerably gifted with a sense of smell, because of trifling additions to the fundamental ingredients of these innocent dishes. This may have little bearing on thermostatically-controlled cooking. It has a bearing on nutritional value and the hearty appetites of children. It has point in any comment on Mr. Dunning's most welcome, most valuable, paper.

In the discussion Mr. W. E. Benton, among others, gave his views on tasting panels. In his quiet manner he expressed his doubts about such panels each member of which has been certified as 'capable of reacting to the primary tastes.' This, he suggested, sounds a little like expecting higher literary criticism from children with school certificates. And when one reflects on the long experience and training needed to produce a tea-taster or a wine-taster, it seems hardly possible for a panel of ordinary people, accustomed to smoke and eat sweets, and to lace their drinks with Angostura and their food with salt, pepper, vinegar, Worcester sauce, and white sugar, could give answers of much value. And, of course, taste and smell are interlinked. One does not drink the bouquet of, say, a claret, but the bouquet has much to do with the enjoyment of the drink and, as a corollary, its nutritive value. Mr. J. H. Scott, of J. Lyons & Co., Ltd., spoke about cabbage, explaining that considerable care and thought have been given to the cooking of cabbage in bulk. 'The problem,' he said, 'is very difficult. I am afraid the general public are all too familiar with the unsatisfactory result which sometimes occurs.' We would add that often those who do not eat cabbage are all too familiar with its cooking-odour.

What is an ideal scone? This poser was put by Mr. S. J. Cornford, of the British Baking Industries Research Association. He does not feel wholly happy in mind that we could persuade the public to eat scones which are brown all over when they have been used to eating scones white at the sides and brown at top and bottom. Ideal heating conditions produce an all-over brown effect. Some people we know dislike scones whatever their hue; but Mr. Cornford's perturbation relates to scone-eaters by birth and inclination. His remarks also raise the question of tradition. Apart entirely from the matter of the appearance, durability, and toughness of bread-crust, Mr. A. R. Bennett asked why we should accept without question traditional standards as the desirable aim in cooking techniques. There is scope, he maintains, for a more critical approach to accepted procedures—to 'separate what is basically necessary or desirable from pure ritual inherited uncritically from the past.' The newly-wed hostess can take heart in this observation, and give reproof to criticism, however charmingly phrased, of her cooking skill. Mr. Bennett, too, by the way, had something to say about tasting panels. He was referring particularly to short-crust pastry, which he thinks should be put on a 'factual basis.' Radiation Ltd. have carried out a lot of work to clarify the short-crust issue on a long-term basis. They have attacked the problem by physical methods—strength tests. To us, this mode of approach conjures-up both memories and possibilities. They have also studied the reactions of a tasting panel.

We Go Native

It is not for us to enquire into the agreements between management and staff in the Radiation Group. Suffice it that about 50 people picked at random from the office staff were chosen to eat short-crust pastry and to record their impressions (not on the pastry). Statistical analysis of the results led in some respects to 'disconcerting conclusions.' We hope to hear more about this later. At the moment we are confronted with Mr. Bennett's finding that only one person in ten is a highly discriminating short-crust pastry taster, and that a further one in ten is of lesser, albeit significant, capability. Imagine Mr. Bennett's concern on discovering that four-fifths of the tasters were unable to distinguish between pastry cooked at the two main testing temperatures corresponding to Mark 5 and Mark 7 of a Regulo. 'Little improvement in response was found in the judgment of pastry baked even under such differing conditions as Mark 4 and Mark 8.' Well, well.

It will be gathered from our few notes that the paper by Mr. Dunning was extremely well received—as, indeed, it well deserved to be—and that the discussion was full of interest. Had there been time, more would have joined in. The tea-bell had, however, been sounded before the session ended. Knowing, as we emerged from Church House, that our scones would either be cold or would, irrespective of colour, have been eaten by some-one else, we decided that our next port of call would be an oyster-bar. The oysters were uncooked, the bouquet was that of the sea, the colouring appeared to us to be quite natural if a little variegated. The taste was delicious.

D

Common Balanced Flues

GAS COUNCIL Research Communication 13 was concerned with work carried out at the Watson House section of the London Research Station by Mr. W. J. Bennett and Mr. C. H. Purkis on common balanced flues. Presentation of the paper was in the hands of Mr. Purkis, who pointed out that the flueing of gas appliances in multi-storey dwellings raises a number of technical problems, and attention has been focused on this matter in recent years by the increasing interest of architects and local authorities in buildings many storeys high. In the London area, for example, blocks of flats 13 storeys high are being actively considered, and these present an excellent opportunity for gas for the heat services, provided that the technical problems associated with the flues can be overcome. Individual flues might be extravagant in space and capital. The common flue has been used, apparently successfully, on the Continent in conjunction with solid fuel, but has so far met with little favour in this country because of the possibility of transference of smoke or products of combustion from one dwelling to another under adverse pressure conditions. It is considered that this type of flue should be investigated in detail.

The paper describes an arrangement which the authors have called a 'common balanced flue' which attempts to combine the advantages of the common flue and of the individual balanced flue, while avoiding the disadvantages and limitations of each. The common balanced flue consists of two shafts sealed at their lower ends and terminating in adjacent positions above the roof of a building. Appliances—for example, instantaneous gas water heaters—are sealed from the rooms in which they are fitted and connected in parallel across these shafts, one of which serves for the entry of air while the other serves for the evacuation of the products of combustion. Such an arrangement, which preserves nearly all the advantages of the individual balanced flue appliance, could be provided in the centre of a building, well away from external walls; it would require no terminals other than the two above the roof; and it would probably offer substantial advantages in space and cost over individual flues.

If such a system is to operate successfully it is essential that products from an appliance at or near the bottom of the system shall not recirculate through a heater higher up. It is also important that the operation of any one appliance, as regards both combustion and efficiency, shall not be materially affected by the simultaneous operation of any other appliance, or combination, in the system.

The paper describes experimental and theoretical approaches to these problems. In the experimental work, a pilot installation consisting of three circulators fitted across 5-in. flues was shown to operate successfully in the laboratory, and a larger installation was then constructed in which five instantaneous multipoint water heaters at 8 ft. 6 in. spacing were connected across two 12-in. shafts, the latter terminating above the roof of the building. In a third installation the 12-in. shafts were replaced by 6-in. ones. Experimental observations included combustion and efficiency measurements and a study of the effect of introducing restrictors to limit the flow of air through the heaters.

The agreement between theory and experiment is regarded as encouraging in view of the assumptions involved, though correlation between the figures for the unrestricted cases is much better than for the restricted installations. This tends to indicate that the theory is basically sound, but that the values assumed for the resistance of the orifice plates require further consideration. The theory has been used to predict the essential design data for a 10-storey installation, and it is suggested that two 12-in. diameter flues would suffice for 10 appliances rated at 200 cu.ft. per hour and spaced at 8 ft. 6 in. apart. Obviously, more experience is necessary, and many questions remain to be answered; the whole question of condensation in very tall flues, for example, is under active investigation at the present time. However, the potential gas load in the proposed multi-storey dwellings is considerable, and approaches such as the one described in the paper by Messrs. Bennett and Purkis are certainly worth exploring.

The point was brought out in the discussion that the balanced flue principle can be applied only to appliances which function when sealed from the roof. This includes convector space heaters and water heaters, but does not include appliances such as gas fires and drying cabinets. The authors suggested that balanced flue appliances could only be fitted to outside walls. This is, of course, the most convenient arrangement; but if there is a source of air from outside at any other place, the appliance can be fitted there. Other comments concerned matters of design which might prove useful in lowering the carbon dioxide content of the flue products and guarding against condensation. A general impression was gained that the common balanced flue has the advantage of the common flue without the possible disadvantage of back circulation of products from one appliance into a room where there is another appliance which is not being used. The authors have certainly obtained most promising results from their experiments to date; it is all very encouraging.

Fluidised Gasification

THE increased use of methods of mechanical mining in Great Britain during recent years has led to the production of fine coal in such quantities that its effective utilisation has assumed great importance. Much of this fuel is non-caking, and might well be gasified by established processes such as the Winkler or Lurgi. There is also a heavy tonnage of caking fines which cannot be processed by these methods unless pre-treated to reduce its caking properties. Hence there would seem to be a need for a new process, or modification of an existing one, which would allow the gasification of this latter class of fuel either alone or in admixture with any proportion of non-caking or weekly-caking coal fines. This constitutes the *raison d'être* of the work of the Institution Gas Research Fellow, Mr. B. H. Thompson, who, with Dr. J. E. Garside, submitted an interim report, 1952-53.

Mr. Thompson outlined the advantages of fluidisation and also its disadvantages. The latter, he suggested, should not seriously detract from the merits of a highly flexible process relatively simple in design and operation and comparatively cheap in construction. The object of the investigation at Leeds University is to develop a process for the gasification under fluidised conditions of all types of coal fines, irrespective of whether they are of a caking nature or not, the process to involve only one stage without any pre-treatment zone.

To overcome the difficulty of the formation of agglomerates when using caking coals which pass through a plastic stage when heated, it is proposed to add to the fuel a quantity of a fine inert material under such conditions that it will be evenly distributed throughout the fluidised bed and should thus separate the coal particles from each other. It can be argued that the use of such an inert material will not remove the difficulty in that the plastic coal particles will now simply stick to the inert particles instead of to one another, again giving agglomerates which would cause loss of fluidity. If, however, the inert is either (a) of a material not 'wetted' by the coal, or (b) sufficiently fine that a coal particle

(*Continued on p. 796*)

OURSELVES AND OUR JOBS

FROM A PAPER TO THE YORKSHIRE JUNIOR GAS ASSOCIATION, DECEMBER 5, 1953, BY

A. W. FIELD,

Personnel Officer and Buyer, Sheffield Division, East Midlands Gas Board.

INDUSTRIAL relations, which do not form an exact science, affect intimately everybody engaged in earning a living. We take these relationships between management and employee too much for granted; and we would do well to review the great changes which have taken place in the gas industry since nationalisation. Prior to May, 1949, there were about 1,000 different undertakings—large and small—which for the most part were members of various regional gas industrial councils. On the other side of the table were the trade unions. The regional councils are now resolved and have been replaced by the area joint councils covering all grades of employee.

The gas industry—whatever else may be said of it—has always been proud of the good relationships existing between management and employee. The pattern of that relationship has kept pace with the changing conditions and opinions throughout the years; and if we take a dispassionate view of those relationships today, I believe we can truly claim them to be better than ever.

Before nationalisation the basis for negotiating terms and conditions of employment of manual workers was by agreements made nationally and regionally. Broadly, this is the manner in which negotiations are conducted today. In regard to staff employees, however, the arrangements were much more haphazard, some operating under local authority agreements, some under regional council agreements, while others operated under local undertaking agreements or under no specific agreements at all. The present position is different and a commendable improvement is that there is a national agreement covering the terms and conditions of employment of the majority of staff officers. Additionally, there are national and area joint councils covering these officers, together with those outside the grading scales. Intermediate grade employees —a new class so far as the gas industry is concerned—are also covered by their own agreements and by their own national or area joint councils or committees.

Greater Co-ordination

While, therefore, there have been certain changes in the machinery of industry relations, these are not fundamental. They can be regarded as an enlargement and a co-ordination of negotiating machinery already in existence at vesting date. The fundamental change, as I view it, concerns numbers, and by that I do not mean mere increases in numbers of persons employed. The total number of people employed in the gas industry at the end of July, 1953, was 133,500, compared with 122,000 in 1949. In 1949, with approximately 1,000 separate gas undertakings, the average number of employees per undertaking was 122, whereas in 1953, with only 12 separate area boards, the average number of employees per board was 11,125. From this angle, the problem of industrial relations takes on a very different aspect.

Before May 1, 1949, there was little personal contact between the employees of one undertaking and another, such contact being largely confined to meetings of managers or such associations as our own. Little, if any, news or information concerning industrial relations, therefore, passed directly between undertakings except at management level. The contrast today is startling. In comparison with the single unit pre-vesting day, employing an average of 122 persons, we have single units—the boards—employing an average of over 11,000 people who are in much closer contact with one another than ever before through their daily work and through sports and social clubs and other activities. This is accentuated when we come to groups or divisions. In my own Division, for example, over 3,000 people are employed and all grades of workers are in very close contact with one another. In consequence, news, views, information, and decisions are circulated rapidly and affect a far larger number of people than ever before. What once affected a hundred men may now affect many times that number and can have much more far reaching results for good or ill.

'Rate for the Job'

It is a cardinal principle in any good industrial relations system that, to reduce to a minimum envy, jealousy, and all other uncharitableness, the basic principle of 'rate for the job' should apply, and that the maximum degree of uniformity should obtain in regard to other conditions of employment. In this direction an enormous amount of good work has been done during the comparatively short time since May, 1949. Few would have dared to predict at that time that the industry could have hoped to reach the position in which it stands today. Nationalisation has meant in many cases that the spheres of activity of individuals have been narrowed, and their responsibilities channelled into more specialised functions. This tendency to specialise—far from reducing the responsibilities of the individual—has tended rather to increase them.

The Gas Act necessitated drastic changes in the gas industry's organisation. Nobody would claim that the change-over has taken place without incident or without upset to personal feelings or positions; the magnitude of the task and the great number of people involved made upsets inevitable. But such disturbances have not been deliberate. It is not the size of a cog in a piece of machinery which matters. What does matter is that the cog is of the right material, size, and shape and able to take its full share with other cogs in driving the machinery.

Training in Leadership

People work primarily for monetary reward. If, however, that is the sole reason (and in many cases it is) then work becomes unsatisfactory. If, on the other hand, there is additionally a sense of 'belonging,' of being an essential part of an organisation, then work becomes of greater moment—something to be done because it is felt to be of value. This is the measure of our responsibility.

Two fundamental attributes are demanded of those employed as part of management—knowledge of the job in which the person is engaged, and ability to supervise those placed under their authority. Of late years there has been a growing realisation of the importance of all forms of training, particularly leadership training, but it must be admitted that the gas industry, with one or two notable exceptions, did not prior to nationalisation pay very much attention to this matter. Subsequently, however, the whole question of training and education has received consideration, and more education and training schemes are now in operation. One of the most valuable schemes for training in leadership is Training Within Industry. Some people have no high opinion of its use. Others pay lip service to it but do not really believe that it can be of material benefit. For myself, I am convinced that, if it is properly used, it can be a force for good. It teaches people, when dealing with problems of human relationships, to think before they act. Moreover, groups bring together people who may not have met before or who see each other but rarely, encourage the exchange of ideas and views, and promote a feeling that the individual counts for something in the general scheme.

In too many cases, the fundamental approach to industrial relations problems is not what it should be. One might say that getting facts should present no difficulty. In practice, I have found it far and away the most difficult and trying part of any industrial relations problem. Facts are made up of conversations, events, and achievements. The main obstacle in arriving at agreement on what was

(*Continued on p. 785*)

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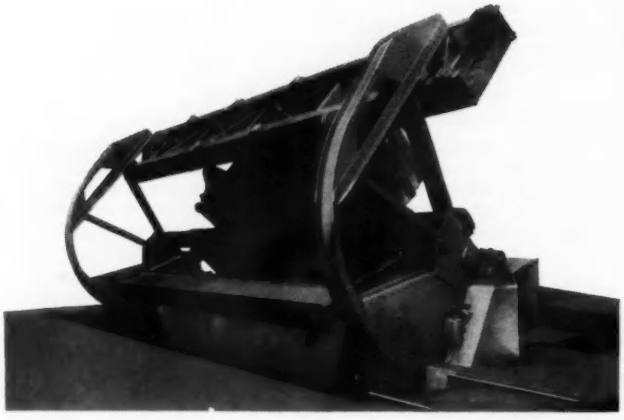

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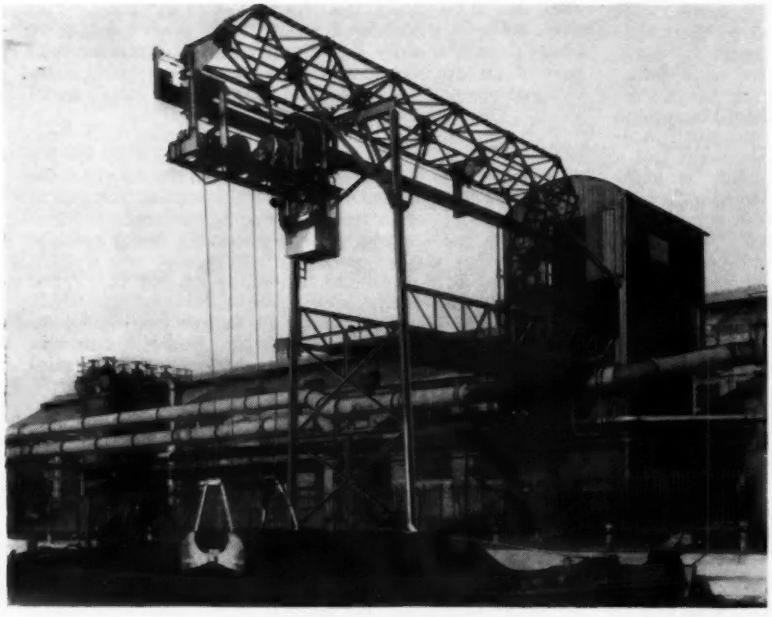

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said, what happened, and what was done, seems to be due to the difficulty people have in differentiating between opinions and facts. What people *think* happened does not matter; what people did or said are the facts that count. And without facts it is impossible to attempt the solution of any problem.

Before vesting day the average gas undertaking was of a size which enabled management to deal fairly easily with management-employee problems; since then, however, the pattern has so changed and the size of the unit has so enlarged that such close contact between higher management and employee is no longer possible. Other means have had to be found. Among them the joint councils and joint consultative committees play a major rôle. The trade union representatives on the joint councils are, I believe, far more fully informed on matters of policy changes, new policies, and future plans than they have ever been, and are consulted and their opinions sought to an extent which would not have seemed possible a few years ago. The formation of the joint consultative committees was recent in the gas industry, but joint consultation, being generally confined to the immediate problem, is limited. But the committees will constitute one of the best tools for forging a first-class relationship between all sections of employee.

The scope of joint consultation is confined to questions concerning health, safety, welfare, efficiency, productivity, and the general well-being of the gas industry. All questions affecting terms and conditions of employment are matters for negotiation, not consultation. Negotiation and consultation are two entirely different provinces. Consultation is applied in cases where there is unity of purpose and where the object is to determine how best that purpose may be achieved. Negotiation is employed to find a common form of agreement where the parties concerned are of different minds concerning the subject under review.

Critical Examination

The gas industry is not yet doing what it could do in regard to training for management. I know from experience that all members of management are fully occupied in the everyday routine of their work, and that, in consequence, the tendency is to take this routine and all that goes with it for granted. Not enough people are giving their jobs the critical examination and analysis which they need; not enough people are asking whether this or that way is really the best way of doing a job—and so on. Individuals can be trained to think along these lines, and if a sufficient number are so trained and encouraged to think, the results will quickly become apparent and can most definitely be measured in terms not only of money saved but of personal satisfaction. Much of this sort of work is done by teams of organisation and methods experts. I would much rather see it done—as a matter of course—by our own personnel. The results would be more tangible and lasting.

TWO PAPERS TO THE WESTERN JUNIOR GAS ASSOCIATION

PROBLEM OF RETORT LEAKAGE

F. R. RENDLE,
Plymouth (Coxside) Station.

We are concerned at the present time with rising costs and the need to resist further increase in the price of gas. There can be few causes which more adversely affect the smooth running and economical working of a gasworks than leakage from retorts. The following conclusions are based on experience with continuous vertical retorts. I think they could apply to other types of retorts. I will outline a few of the effects of retort leakage:—

(i) Early resetting becomes necessary, with its heavy capital expenditure.

(ii) Reduction of gas-making capacity occurs during the resetting period.

(iii) Reduced coal gas production necessitates increased carburetted water gas production.

(iv) Less coke will be available for sale.

(v) Expenditure involved in acquiring and maintaining apparatus used for 'hot' repairs.

(vi) Cost of the materials and labour used in repair operations.

(vii) Wholesale disorganisation of gas-making and scurfing programmes.

In the retort house itself, the effects of retort leakage will be more evident. There will ensue: Local overheating and excessively high combustion chamber temperatures; slagging and erosion damage to walls, floor tiles, and so on; and the possibility of overheating the end-plate of the waste heat boiler, especially if there should be a major collapse of a retort wall due to intense overheating.

How Leaks Begin

Leaks usually start in a small way and are often first seen as a wisp of yellow-white flame emerging from a joint in the retort brickwork into the combustion chamber. The high temperature of the coal gas flame soon causes the rapid enlargement of the leak and encourages the development of other leaks. The affected retort, therefore, should be emptied immediately to prevent more serious damage and to facilitate repairs. It may not always be possible to achieve this. In such cases a useful expedient is to reduce the air supply to the combustion chamber. The volume of leakage can also be reduced by keeping the pressure in the retort to a minimum, adjusting the retort offtake pressures and avoiding uneven coal travel.

A useful method of detecting and locating leakage can be used when the retort is empty, and scurfing operations have been completed. Bundles of rag or cotton waste, which have been soaked in waste lubricating oil or paraffin oil, are inserted into successive combustion chambers while the retort is being visually inspected from the top. The leaks will then reveal themselves, depending on their size, as fingers of yellow flame or wisps of smoke travelling from the combustion chamber to the inside of the retort. This simple inexpensive procedure will establish which chambers is affected, the size of the leak, and its position on the axis of the retort.

There are three methods commonly used for stopping leaks while the retort is still under heat—airborne sealing, wet spraying, and welding.

Low-pressure Airborne Sealing

Recently we have made experiments with a low-pressure airborne sealing technique. This method is used where leaks of medium size are known to exist in the retort to be treated. The pull in the first combustion chamber has first to be set to 5/10 in. W.G. by suitable manipulation of the waste gas control damper. During the first hour of treatment the pressure within the retort is not allowed to exceed ½ in. W.G., this being accomplished by closing the air regulating shutter on the fan casing of the airborne sealing machine. This maintains a suitable differential across the retort walls and prevents the powder from being blown rapidly through the leaks and into the combustion chamber. After the first hour the retort pressure is gradually raised to the normal maximum.

By this method medium leaks have remained gas-tight for about a fortnight. It is hoped to extend this period.

Where airborne sealing is a normal routine after scurfing, no extra expenditure of time or money is involved in sealing medium leaks by this modified method.

Another suggestion which we have considered, but not actually tried, is airborne sealing from the combustion chamber side. The technical difficulties of this method are a deterrent, but since most leaks are found to be larger on the combustion-chamber side than on the retort side, it seems logical to try to seal them from the outside.

From a theoretical point of view the wet spraying of red-hot silica can never be justified. But if a sufficiently fine spray is used, most of the water evaporates before reaching the brickwork and a large proportion of the cement adheres firmly. Excellent results can be obtained by using a mixture of 10 lb. of No. 1 'Tamac' cement, 1½ lb. of commercial borax, and 100 ml. of commercial phosphoric acid.

The acid and borax are dissolved in hot water and then the 'Tamac' and sufficient hot water are added to give a suitable creamy consistency. This slurry is sprayed on the inside of the retort using a 20 ft. length of ¾ dia. iron pipe fitted at one end with a stainless or hardened carbon-steel spray nozzle and at the other to a 'Four Oaks' spraying machine, via 18 ft. of ¾ in. dia. rubber hose. One coat of sprayed material should be allowed sufficient time to bake hard on the retort surface before a second coat is applied or before the retort is put to work again.

The Welding Process

Welding is a process of spraying a dry refractory cement through an oxy-coal-gas flame, the cement powder being carried to the burner head in the oxygen stream. In passing through the intensely hot flame, the cement becomes fused and impinges upon the retort wall at the position of the leak, where it builds up in a semi-molten condition, forming adherent patches and lling up the leaks.

Our experience is that wet spraying has several advantages over other methods of sealing leaks.

Leakage may, in some cases, be associated with 'tunnelling' or 'honeycombing' in the heart of the refractory sections. This action leaves the sections hollowed. The application of excess heat by flame welding might have far-reaching harmful effects on the weakened sections. Abnormal stresses set-up in the retort brickwork sometimes cause a shearing effect along a horizontal line of joints. Resultant seepage of gas is through the long thin crack thus formed and will probably take the form of a number of small leaks. Attempt to seal such a fracture by welding may result in the displaced joint being still further weakened. In any event it will take time.

I would stress that the welding operator must have accessibility to the inside of the retort. Where the coke extractor involved cannot provide such accessibility, it may be necessary to lower the extractor casting—an arduous and expensive proceeding. The resultant circulation of air in and around the lower portion of the retort has a detrimental cooling effect on refractory sections which are in the hottest zone when the retort is working. This effect will prejudice the effectiveness of the welding repairs. On completion of repairs and replacement of the extractor casting, the joint between the bottom of the retort and the extractor casting has to be made while hot. This results in the joint being less effective and gas-tight than one made under cold conditions.

ERECTION OF A 300,000 CU. FT. SPIRAL HOLDER

IN the course of a paper given to the Western Junior Gas Association on November 18, Mr. S. T. FRANKS, M.INST.B.E., ASSOC.INST.GAS E., Works Manager, Edward Cockey & Sons, Ltd., said:—

The erection of gasholders requires skill, experience, and knowledge of their functions. Gasholder erection has to be planned before its design reaches drawing-board stage particularly when it is of multi-lift construction. The working spaces between the lifts and tank determine the order in which these units are fabricated and delivered to the site.

If the holder has a steel tank, this is the first unit to be considered. Materials have to be scheduled and ordered. The unit has to be fabricated at the makers' works, and takes up a major part of erection time on site. The lifts have then to be considered as to which must follow after the tank. It is here that the working spaces determine the sequence. The minimum practical working space between tank and lifts for erection purposes is 14 in. to 15 in. wide and spaces of such widths are rarely provided between the outer lift and tank in gasholders of less than 500,000 cu.ft.

The gasholder which is the subject of this paper has 10½ in. space between the outer lift and tank and 15 in. space between the inner and outer lifts, both spaces being insufficient to allow for the lifts to be erected in sequence from tank bottom level. It was therefore necessary to erect the inner lift after the tank and to build the outer lift above the tank balcony level, lowering it downwards between the tank and inner lift in stages as it was erected.

The tank bottom plates are placed on the foundation slab in convenient positions for assembling together and those having inlet and outlet pipe connections are erected first in correct relation to the pipe pits. The whole of the tank bottom is assembled on box frame and prop supports 2 ft. 6 in. above the foundation surface to provide working space for riveting and for inspection during the subsequent water test. The first tier of side plates with the curb is then erected on the bottom and riveting is completed of the whole of the bottom and about 12 in. up the tank side in order to contain the 9 in. depth of water for testing.

A specified number of special screw connection holes provided in the bottom for lowering are blanked off and the connections for the inlet and outlet pipes are plugged. Then 9 in. of water is run into the tank for testing the bottom. When the tank is proved tight the water is drained off and the lowering screws are inserted through their connection holes. At the same time, a specified number of trestles (usually one to each side plate seam) are positioned round the perimeter of the tank, each having screw and bracket attachment to the tank side plates. The whole of the tank fabrication is supported on the screws at one definite level and the supporting box frames and props are removed from the underside.

The bottom is then dried, cleaned, and coated on the underside and a layer of sand is evenly spread over the foundation slab. After the coating has dried the whole of the tank is lowered on to its foundation.

A mobile crane is placed inside the tank. The crane is fitted with scaffold platform and rollers by which it traverses the perimeter of the tank. It is used for the erection of the remainder of the side plates and the tank balcony and is retained for the subsequent erection of the inner lift. The tank plates are bolted together at a close pitch to ensure metal-to-metal tightness, the bolts being removed as riveting proceeds. Continuous platform scaffold is fixed both externally and internally for riveting.

Inner Lift Erection

The first unit of the inner lift to be positioned and assembled is its cup. The usual method is to insert accurately-cut wood blocks between the cup and the tank at equal distances around the perimeter and a cup of true fabrication will fall into curvature with the blocks tightly wedged in position.

The spiral rails are erected concurrently with the vertical stays, each rail being checked at its angle of 45° and the vertical stays as being plumb. The panels of side sheets are fixed in between the rails and should take their respective positions without forcing or buckling in shape. The top curb and crown margin row of plating is attached to the rails and stays; the whole of the fabrication being erected with the mobile crane and all seams and joints closely bolted together.

The crown framing and structural supports are hoisted and fixed in position by derricks. The purlins and bracing

(*Continued on p.* 791)

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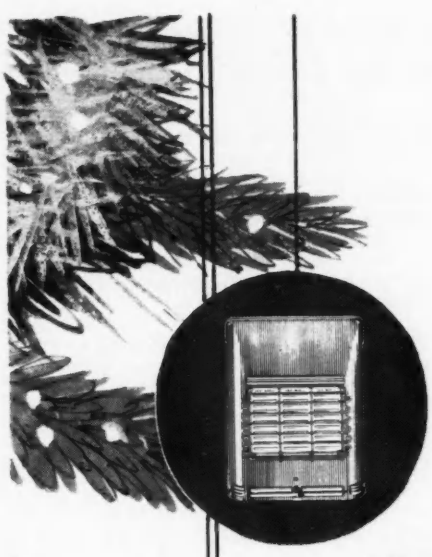

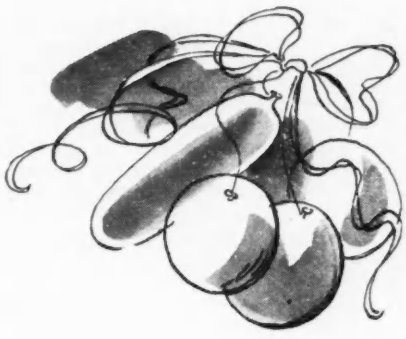

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are erected in each bay as the main and secondary rafters are attached. On completion of the crown framing a scaffold platform is suspended from the rafters for the laying of the crown sheeting.

The whole of the crown covering is assembled complete before riveting is commenced and special precautions are taken to avoid depressions or distortion of the sheeting by the weight of men working on the top side. Some of the crown sheets over the rafters are temporarily removed for the attachment of beams used in the lowering of the outer lift which follows after the inner lift.

The outer lift is built above the tank balcony and lowered downwards as it is fabricated. A tripod derrick is used for the erection. The bottom curb with the bottom row of plating is assembled on level packings above the balcony and is supported on short beams bridging the space from balcony to inner-lift margin row.

The spiral rails are hoisted simultaneously with the vertical stays, each rail being checked for 45° inclination and the stays for being plumb. The second row of side sheeting is assembled and riveting proceeds on the lower seams and joints, then follows the third row of sheeting and the rail inclination at 45° is checked as each row of sheets is fixed. After the fixing of the third row of sheets the first lowering operation is executed.

Lowering beams of suitable section are positioned on the inner lift crown, packed up level at the curb end, and attached to the rafters through the crown openings with stirrup fasteners. Lowering screws with hook attachments are secured to the outer lift curb and suspended through the beams. The weight of the partly built lift is suspended true and the bridge beams and packings removed.

The lift is lowered uniformly until it reaches the next convenient stage of assembly. When the lowering screw is run down to its extremity the point load is temporarily supported by chains for the insertion of a hook or chain extension and the screw is raised upwards ready for subsequent lowering. This procedure of building and lowering is followed until the grip is assembled and riveted. The completed lift is finally lowered on to the rest blocks and is positioned concentric to the tank and inner lift by the insertion of spacers.

The carriages are fixed in their positions with regard to specified clearances. The first air inflation proves the accuracy of the carriage location, and adjustments are usually easily effected.

The building of gasholder lifts above the tank balcony would appear to be a more expensive procedure than erection from the tank bottom, and one is prompted to suggest that small gasholders may well be designed with wider cups and grips and wider clearance to the tank to provide adequate working space between these units. The convenience of working on the balcony and margin row of the inner lift instead of the necessity of scaffolding with its continuous ladder access practically balances labour costs one with the other in man-hours in erection, providing the work is executed under skilled supervision to ensure that the 'stage process' of building and lowering does not introduce an element of inaccuracy and faulty workmanship. There is, however, a strong case in favour of wider clearances for the convenience of eventual repair work, a factor which is not always considered by the designer.

Manufacture of

CONCENTRATED GAS LIQUOR

FROM A PAPER TO THE MIDLAND JUNIOR GAS ASSOCIATION, DECEMBER 1, 1953, BY

N. CALVERT,

M.Sc., M.Inst.Gas E., Chief Chemist, Nottingham Undertaking, East Midlands Gas Board.

Prior to the last war, many gasworks were finding the manufacture of sulphate of ammonia was rather expensive and were looking for alternative means of disposal for their crude ammoniacal liquor. Usually the first step in reduction of costs was to discontinue 'liming' and thereby only to recover the free ammonia. Some small works were transporting their crude liquor to larger gasworks or to chemical works and were looking for means by which the transport costs could be reduced. The obvious solution in most cases was to concentrate the gas liquor to as high a strength as possible and then dispose of the product to some chemical works where it could be manufactured into sulphate of ammonia more efficiently.

At first glance the manufacture of concentrated gas liquor appears very simple, for all that seems necessary is to distil the crude liquor with as little steam as possible, consistent with stripping the crude liquor of free ammonia, and then to condense the products. Such a plant, however, would very soon give trouble due to crystallisation if it were used to make concentrated gas liquor of a strength greater than 15% ammonia. In general, chemical works do not want concentrated gas liquor of a lower strength than 15% NH_3 by weight, which is about 16.5 grammes of NH_3 per 100 cc. Thus a plant to be reasonably trouble-free and to make concentrated liquor of over 16.5 grms. of NH_3 per 100 cc. must have some form of decarbonation—*i.e.*, reduction of the CO_2 content of concentrated gas liquor. Otherwise the plant will be continually shutting-down due to blockages, the storage tank for the concentrated liquor will rapidly accumulate crystals, and the rail tanks used for transporting the concentrated liquor will continually gain in tare.

Decarbonation

There are two methods of decarbonation of which I have had experience:—

(1) Vapour-phase decarbonation. In this system the crude liquor is distilled and the vapours are partially condensed. On cooling such vapours, water condenses first and this rapidly absorbs ammonia. The ammoniacal solution so formed begins to absorb the carbon dioxide. The more concentrated the ammoniacal solution, the more rapidly it absorbs the carbon dioxide. If the uncondensed vapours can be tapped off before much carbon dioxide has been absorbed a concentrated gas liquor can be produced which has been partially decarbonated and should therefore, be free from crystallising troubles.

(2) Liquid-phase decarbonation, in which the crude liquor is heated in a decarbonator to such a temperature that sufficient carbon dioxide is driven off, without much ammonia, so that the partially decarbonated crude liquor on distilling will give a concentrated gas liquor free from danger of crystallisation.

Vapour-Phase Plant

In 1939 it became obvious that the sulphate of ammonia plant at Basford works would soon have to be practically rebuilt if it were to produce the large crystalline form of sulphate which was in demand. The time seemed opportune, therefore, to consider the manufacture of concentrated gas liquor instead of sulphate, especially as crude gas liquor was being transported from Eastcroft, the other Nottingham gasworks, to Basford works by rail tanks. Eventually it was decided to install a concentrated gas liquor plant at Basford to deal with 16,000 gal. per day and one at Eastcroft of about half the capacity. The rail tanks used for transporting the crude liquor from Eastcroft to Basford would then be available to transport the concentrated liquor from both works to the chemical works. A contract was negotiated with Brotherton & Co., Ltd., to take the whole of the concentrated liquor produced at both works.

At Basford a vapour-phase plant was built by Newton Chambers & Co., Ltd., using the stills then in use for the manufacture of sulphate.

The 'liming' section of the old stills was kept in use

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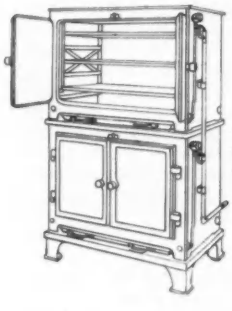
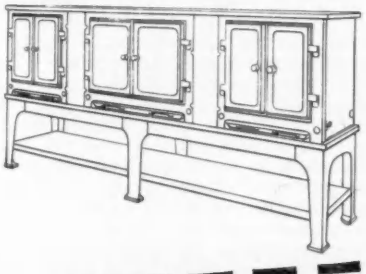


A Vertical Battery of two ovens on a short stand.



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though no lime was added, since no attempt was made to recover the fixed ammonia. In this plant the crude liquor was delivered by a turbine-driven centrifugal pump through an Arca valve to a preheater, where it was preheated by the vapours from the still. From the preheater the hot crude liquor was delivered to the top of the free still, finally leaving at the bottom of the fixed still through an effluent float valve. The bulk of the steam for distillation entered at the bottom of the fixed still and the vapours distilled off from the top of the free still passed through the preheater for cooling by the crude liquor and then through a water cooled condenser in which their temperature was reduced to 50°-55°C. At this point it was hoped that the bulk of the ammonia would have been condensed and that little carbon dioxide would have been absorbed. The uncondensed vapours were tapped off and led away to an oxide heap via a scrubber in which most of the uncondensed ammonia was removed. The concentrated liquor which had been formed passed through a final cooler into the concentrated liquor storage tank via a seal and sight-glass.

The throughput of the plant was controlled by the steam supply. An Arca steam valve was set to give the desired steam pressure at the inlet of an orifice plate and the thermostatically controlled Arca valve on the liquor supply operated to give a constant still-head temperature. The cooling water in the primary condenser was similarly controlled by an Arca valve to give a constant temperature at the point from which the uncondensed vapours were tapped off.

Operation of Vapour-Phase Plant

This plant was put to work on May 1, 1942, and produced concentrated liquor of S.G. 1.100 NH_3 17% wt/wt when distilling 16,000 gal. of crude liquor per day. The still-head temperature was 86°C. and the temperature of the uncondensed gases at the point where they were bled off was 59°C. On reducing these temperatures to 84°C. and 56°C. a concentrated liquor of S.G. 1.108, NH_3 18.7% wt/wt was produced.

The recovery of ammonia as concentrated liquor was only about 70% of the free ammonia entering the still as crude liquor. About 30% was left uncondensed and was tapped off with the carbon dioxide, etc. The bulk of this ammonia was recovered in the foul gas scrubber. The scrubber liquor which was returned to the crude liquor cistern often contained up to 4% free ammonia, showing the excessive amount of ammonia in the gases entering the scrubber. When the plant started up, the free ammonia in the crude liquor was about 1.1% and this strength steadily rose because of the strong scrubber liquor being returned to the crude liquor storage.

It was possible on this plant to make 20%-22% liquor —*e.g.*, in July, 1943, concentrated liquor of S.G. 1.140, NH_3 22.37% wt/wt, was made without any trouble, and for quite a time the strength was over 21%. Yet any attempt to make maximum strength would result in constant trouble on the plant. The temperatures only needed to fall a fraction and the plant would be choked with crystals.

Eventually we decided to run the plant so that in summer the strength was about 18.5% wt/wt with a S.G. of 1.105, and in winter to reduce the strength to about 16.5% wt/wt and S.G. 1.085.

In this type of plant the conditions are ideal for formation of solid ammonium carbonate at certain places. All the ammonia and carbon dioxide are distilled from the crude liquor, but, on cooling down, the ammonia is first absorbed in the condensed water. Therefore the CO_2/NH_3 ratio rises rapidly in the uncondensed vapours. In this way solidification begins on the upper side of the condenser tubes while the condensed liquor runs away along the bottom. Eventually the tubes may block completely.

It was necessary to keep a sharp eye on the still pressure, and in the event of a rise (in our case to above 3 lb.) it was customary to shut-off the supply of crude liquor and steam-out the plant.

One place where blockage was very prevalent was the foul gas line from the scrubber to the oxide purifier. Conditions at this point were ideal for the formation of crystals as the CO_2/NH_3 ratio was very high and most of the line was exposed to the open air. The most successful remedy was a small water spray in the vertical pipe as soon as it emerged from the inside of the building. This kept the sides of the pipe well washed and free from crystal. The line was also steamed-out daily to ensure that the horizontal section was kept clear.

The plant ran fairly smoothly with occasional shutdowns to steam-out. If there were a serious blockage—*i.e.*, the tubes in the water cooled condenser had choked with crystals—we found the normal steaming-out was very slow. The best method was to drain the water from the condenser and put steam back along the water side. In this way the blocked tubes were heated from the outside and soon thawed out.

Overload Working

After 1942, the demand for gas began to rise rapidly and the crude liquor made increased. Soon the concentrated liquor plant was overloaded. Instead of dealing with its rated capacity of 16,000 gal. per day the throughput was 25,000-28,000 gal. per day. Luckily the still could easily deal with this overload, but there was difficulty in condensing the vapours, for even with maximum water on the condenser it was not possible to lower the temperature to the desired figure of 54°C. before the uncondensed gases were tapped off. If, however, the still-head temperature were lowered and the maximum water left on the condenser, then the vapour-phase temperature was lowered by about the same amount. It was decided, therefore, to run with the still-head at 83°C., consistent with an effluent of 0.02% free NH_3. Such a figure, however, would make stronger liquor than was desired. An auxiliary supply of water was added to the condensate as it left the pre-heater, the rate at which the water was added being adjusted to avoid crystallisation troubles. In this way it was possible for long periods to run at 50%-80% overload with reasonable results.

After some months operation it was noticed that crystals were growing in the concentrated liquor storage tanks. These crystals could be felt when dipping the tank for stock purposes. In June, 1944, during a shutdown of the plant the concentrated liquor tank was emptied and the manhole cover removed. It was seen that crystals were accumulating round the sides, the bottom, and the top of the tank. The tank was filled with water and left overnight, and the following day the solution was pumped into rail tanks and returned to the crude liquor cisterns at the rate of two tanks per day. The solution was found to be NH_3 3.2%, CO_2 5.0%, CO_2/NH_3 1.56.

Leakage and Corrosion

In August, 1943, after the plant had been working for 16 months the strength of the concentrated liquor produced fell rapidly and its volume increased. The preheater was dismantled and the inner tubes were examined. A small hole was found in one of the inner tubes. This tube was replaced and all the rubber washers, which sealed the inner and outer tubes at the header section, were replaced. From this time leaks developed every few months, due either to holes in the inner tubes or to the washers perishing. When dismantled the inner tubes were always tested for leakage. In certain cases, if the leak were only a small hole and the rest of the tube was in good condition, the hole was drilled, tapped, and plugged, and the tube was as good as new.

During 1942-50 we replaced 17 inner tubes—about two tubes per year. We also replaced four bends and eight small specials during 1949. We had comparatively little trouble from corrosion.

The rail tanks used for transporting the concentrated liquor occasionally developed leaks. Patches were welded on until eventually the barrels became so thin that they could no longer be welded and had to be replaced. In general, a barrel lasted about seven years.

In December, 1949, a rather alarming accident happened. I was notified that the concentrated liquor storage tank was overflowing. On investigation I found that the outlet of the small vapour scrubber on top of the concentrated

(*Continued on p. 795*)

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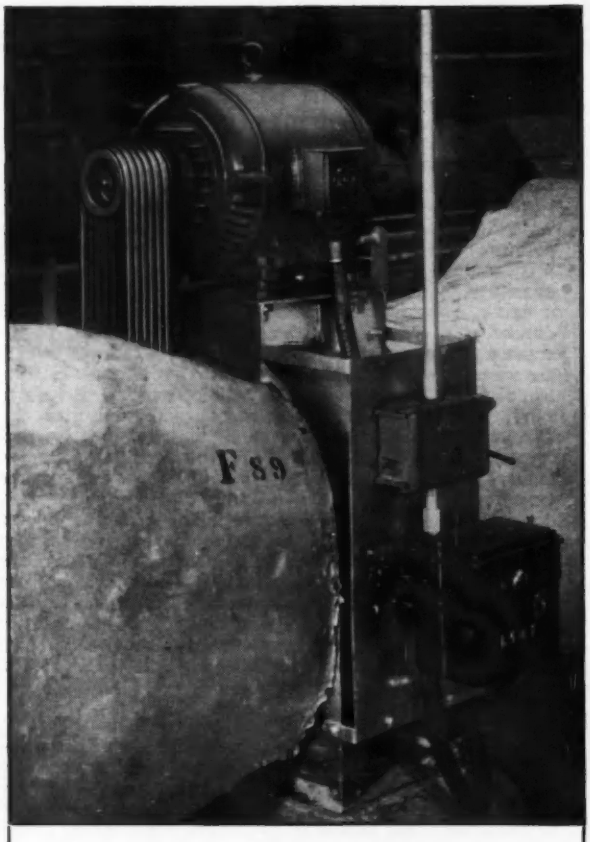

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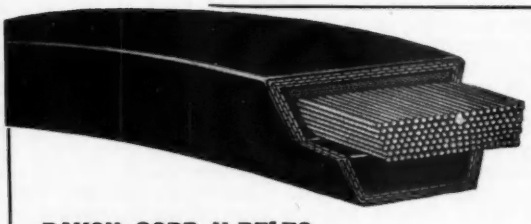

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storage tank had blocked and the crude liquor had built up inside the scrubber and overflowed into the storage tank. This was easily remedied, but a more serious discovery showed that a crack had developed in several side plates of the storage tank and that concentrated liquor was oozing out. The crack was about mid tank level and running largely horizontally through three or four cast iron sections of the tank. It had been very cold during the night and the attendant informed me that he heard the side cracking with quite loud reports. Luckily not much concentrated liquor was escaping and so the storage tank was emptied to below the crack level. The crack soon crystallised-up, so there was no escape of vapours. As alternative storage was not available it was necessary for some considerable time to arrange that the depth of concentrated liquor in the storage tank did not reach the crack level. When we were eventually able to inspect the tank it was found that most of the tie rods inside the tank had corroded away. The cracked plates and tie rods were renewed.

The operation of the stills gave very little trouble. From the installation in 1942 until the plant was shut down in 1950, it was only necessary to shut down on two occasions to clean out the fixed still. It was found good practice to run-off from the bottom of the free still, at 24-hour intervals, any heavy tar which had collected.

A meter for the crude liquor to the plant was installed when the plant was erected. It was a source of frequent trouble and was repaired several times. It did, however, run for a sufficient length of time to enable us to determine what throughput of crude liquor corresponded with what steam pressure.

Liquid-Phase Plant

As the concentrated liquor plant was working practically continuously at a big overload and as a new carbonising plant to produce 4,500,000 cu.ft. per day was to be built, it was decided that another liquor concentration plant of about double the capacity would be necessary. In 1950 a plant was erected by Newton Chambers & Co., Ltd., to deal with 36,000 gal. of crude liquor per day. This new plant incorporated liquid-phase decarbonation.

The crude liquor is delivered by a centrifugal pump driven by a turbette through a flow gauge which shows the throughput in gallons per hour. After this meter the liquor divides into two parts, one of about 90% of the flow going through the preheater and into the decarbonator (about 3 ft. from the top) and the remaining 10% going directly into the top of the decarbonator so that the vapours evolved in the decarbonator have a cold liquor wash. The whole of the crude liquor then passes down the decarbonator and steam is admitted at the bottom by a thermostatically controlled Arca valve. This valve gives a constant outlet temperature of the vapours leaving the top of the decarbonator. These vapours pass to a small scrubber and thence to the oxide heap. In the pipe from the top of the decarbonator to the scrubber there is an irrigation supply of crude liquor to avoid any crystallation due to carbonates.

In this way the crude liquor is partially decarbonated and heated to 90°-92°C. The hot decarbonated liquor then runs directly into the fixed still where all the free ammonia is distilled off. The ammonia vapours pass through the preheater and are cooled down to 83°-90°C., and thereby preheat the crude liquor.

The Arca steam control valve for the fixed still is regulated by a thermostat positioned, about three-quarters of the way down, in the preheater. There is also a reflux pipe at this point which returns to the still all the liquid that has so far condensed. When the hot vapours leave the still at, say, 95°C. and are cooled down to 85°C. in the upper part of the preheater, much water is condensed, but very little ammonia has been absorbed due to the temperature. This first condensate is very weak liquor and is returned to the top of the still.

This plant differs from the vapour-phase plant in that the throughput of the plant is fixed and the controls regulate the steam supply to give the desired temperatures. In the vapour-phase plant the steam is kept constant and the liquor supply controlled to give the required temperatures. In the new plant it was decided to make use of the exhaust steam which would become available from the gas exhauster of the new carbonising plant. An exhaust steam line was led to the Arca valve and the pressure in this line was regulated to a pressure of 7-9 lb. per sq. in. by means of a make-up Arca valve on a high pressure steam line. This 7-9 lb. per sq. in. of steam was sufficient to supply the plant requirements. The exhaust steam from the turbette passed direct into the still.

Operation of Liquid-Phase Plant

The plant was put to work on December 2, 1950, and immediately fulfilled all expectations as regards efficiency of decarbonation and strength of concentrated liquor produced. There was so little ammonia being returned to the foul gas scrubbers that the strength of the crude liquor in the cisterns fell steadily from 1.9% to 1.25% free ammonia and remained at the latter figure.

It is seldom possible to put any form of plant to work without some form of teething troubles. In the case of this plant the troubles were by no means serious, but at the same time were somewhat disconcerting. The still outlet was fitted with an effluent float valve and on one occasion this float jammed in the open position, thereby emptying the still of all the liquor and allowing the majority of the steam to escape to the effluent pond via the effluent liquor pipe. When this trouble was rectified it was found that the water-cooled condenser section was blocked with carbonate crystal, apparently due to the fall in temperature brought about by insufficient steam passing forward to maintain efficient decarbonation. This is the only occasion on which this plant has given trouble due to crystallisation.

On several other occasions the effluent float valve has jammed in the closed position or has refused to open on starting-up the plant after a shut-down. This causes the still to fill up with liquor and the weight of liquor cuts off the steam entering the still. The trouble soon becomes evident due to the fall in temperature as indicated by the recorder. The cause was found to be a punctured float on the effluent valve. This float valve trouble is the only difficulty we have experienced with this plant since its installation. We have considered the possibility of installing a deep U seal in place of the effluent float valve, but since the float valve is now operating reasonably well the proposed seal has been postponed for the time being. The effluent float valve on the vapour-phase plant operated continuously for eight years without any trouble.

The steam turbette driving the centrifugal crude liquor pump has been discarded and replaced by an electric motor. It was found that the flow of liquor through the plant varied with the pressure of steam available for the turbette. Moreover it was necessary to shut down the concentrated liquor plant when the steam glands of the turbette required packing. Both troubles have been eliminated by the installation of an electric motor unit, and the small additional cost of electricity is easily repaid by the more constant operation of the plant. It was also arranged that crude liquor could be supplied to the plant by an existing Weir pump in case of electrical failure.

Working Results

The plant was designed to deal with 36,000 gal. of crude liquor per day, and this throughput can readily be maintained. In the early days the plant was operated to produce a concentrated liquor of 26%-27% NH_3 wt./wt. and S.G. 1.025. It was found that during very cold weather a small amount of crystals was deposited in the rail tanks. In consequence during the winter the strength of concentrated liquor produced was reduced to 22% NH_3 wt./wt. and S.G. of 1.015, and in a short time the crystals previously deposited in the rail tanks were re-dissolved.

The plant has been operated to run continuously by regulating the throughput of crude liquor to balance the crude liquor made. Operating in this manner avoids any complications which may arise from frequent shutting-down and starting-up of the plant. The total periods for which the plant was shut down due to all causes have averaged about nine days per annum.

From both plants the effluent leaves the still via an effluent float valve and thence to a pond where any heavy

tar settles. From this pond it overflows to another chamber from which it is pumped through a rack cooler where it is cooled by river water. It is then passed through coke filters before entering the sewers. This method works well, and as the plant is seldom shut down there is an almost continuous flow to the sewage works. At the bottom of the decarbonator there is a tar trap which is emptied daily. The tar level in the first effluent pond is also tested daily and any accumulation removed.

On leaving the scrubber the foul gases from the concentrated liquor plants pass through a discharge pipe to two small oxide purifiers. A water-sealed change-over valve was fitted to allow each purifier to be used in turn. Both steam and water services were connected to the discharge pipes for the removal of any crystal formation. Care was necessary when using steam for this purpose since it tended to overheat the oxide with consequent hardening and cracking, thereby allowing some H_2S to escape to the atmosphere. It was found necessary to renew the oxide heaps at fairly frequent intervals.

With the installation of the liquid-phase concentrated liquor plant it was decided to provide for the passage of the foul gases into the inlet side of the coal gas exhauster, which was conveniently sited nearby. In this way the H_2S and NH_3 in the foul gases would be removed in the normal coal gas purification plant. The gases are made to pass through a specially designed water seal which is erected outside the exhauster house building. A continuous water supply is fed to the seal and all connections are fitted with steam purge pipes. The pipes are steamed daily to clear away any deposit of crystals. A syphon pot is fitted on the foul gas line to collect any condensate. This method of disposal of the foul gases is a considerable improvement on the use of oxide heaps and has been highly commended by the Alkali Inspector.

Before adopting this method of disposal of the foul gases it was necessary to calculate the effect of introducing the excess CO_2 into the coal gas stream. It was found that the calorific value of the coal gas would be reduced by about 0.6 B.Th.U. per cu.ft., which we consider to be well within the accuracy of most calorific value recorders. The calculations were based on the quantity of foul gas to be expected at maximum throughputs of crude liquor coinciding with maximum makes of coal gas.

DISCUSSION

Mr. J. A. Tomes (President) said that the problem of disposal of liquor faced all of them, and as the works grew in size the problem increased. The disposal of effluents was in fact difficult, though Mr. Calvert appeared to have overcome the difficulty fairly easily. Some authorities were perhaps more tolerant than others.

Mr. P. C. L. Croxton (Shrewsbury) asked for more details of the type of gas mask used when rail tanks were being filled.

Mr. Calvert, in reply, said that the masks were supplied by Siebe Gorman. They were of Service type, fitted with a special canister to overcome the ammonia fumes. He added that the strength of the fumes varied considerably in the tanks.

Mr. S. C. Crathorn (Birmingham) wondered if it would be a wise precaution to have duplicate concentrated liquor tanks. His own maintenance costs were higher because of dephenolation.

Mr. Calvert said that it might be necessary some time, as a safety precaution, to build a brick retaining wall round the storage tanks. In three years, apart from slight trouble with the effluent float valve, no repairs or maintenance had been necessary.

Mr. R. Middleton (Newton Chambers & Co., Ltd.), explaining how the plates had cracked in the tank at Basford because the mild steel internal tie rods had corroded, said there were three alternative methods of construction: (1) By having the cast iron tank of circular cross section; (2) by using cast iron tie rods internally; and (3) by using mild steel R.S.J. bracing outside and no internal tie rods. He queried if it was necessary to steam-out the foul line daily.

Mr. Calvert said that he was pleased to hear of alternative methods of construction. The daily steaming-out was a precaution which took only five minutes.

Mr. W. Harris (Leicester) thanked Mr. Calvert for the paper, which, he said, would be of great assistance to those at Leicester who were installing similar plant.

Mr. A. R. Myhill (Birmingham) asked why the first step in reduction of costs was to discontinue 'liming,' and thereby only recover the free ammonia.

Mr. Calvert replied that if they added lime, then they had trouble with blockages.

Mr. J. Foxton (Cheltenham) enquired if ammoniacal liquor was a good fertiliser and if it would be better to sell it for that purpose.

Mr. Calvert thought that it might be a good idea for the smaller works to dispose of it in that way if they could be certain of a constant demand.

Mr. A. V. Wainwright (Shrewsbury), comparing cast iron and steel tanks, said that they had used a Lancashire boiler of unknown age from 1937 until two years ago as a storage tank for ammonia. When taken out the bottom of the boiler was corroded but the top was as good as new. From this experience they considered an old boiler ideal for the job and had purchased another one.

Mr. Crathorn proposed a vote of thanks to the author, and **Mr. S. C. Porter** (Birmingham) seconded.

(*Research Meeting Review, continued from p. 782*)

can be fully coated without the agglomerate being appreciably larger than the original coal particle, then this difficulty might not arise.

In both cases it is desirable to keep the amount of added inert to the minimum required effectively to suppress agglomeration. Otherwise the reactor size for a given coal charge would become excessively large—unless, of course, the addition of such fines caused a diminution in the comparatively large voidage which is usually found in fluidised beds. An investigation is in progress on the fluidisation characteristics of mixtures of different size ranges of coal, with special emphasis on the variation of voidage and the range of fluidisation velocities of such mixtures.

At the same time, a reactor has been designed, constructed and tested. This reactor is designed to be as simple as possible while allowing the necessary data for control of the process to be obtained. Results obtained using the apparatus as an air-blown producer are given in the report. It is concluded that there is no variation of gas composition with time, and that for the production of gas of a reasonable carbon monoxide content the temperature should not be allowed to fall below 700°C. under the prevailing working conditions. The reactor has been found to work adequately with good control up to temperatures of the order of 1,000°C.

In regard to fundamental data on mixed size ranges of coal particles, the investigations so far have covered mixtures of the three size ranges: −60 + 72 B.S.S.; − 85 + 100 B.S.S.; and − 120 + 150 B.S.S. These have been investigated singly and as two component mixtures in the first place, measurements being made of voidage, pressure drop, and bed condition with variation in fluid velocity. The results are set out in the report.

Dr. Garside emphasised that fluidisation technique is merely a tool of chemical engineering, and while it may be applied in certain instances with distinct advantages, there are other instances where its application will yield nothing useful. 'You would,' he said, 'no more use fluidisation in certain processes than you would use a screwdriver to loosen a nut. However, it has advantages in many processes. That has been proved beyond question. And, as happens with so very many new techniques, or tools, applications far outstrip our knowledge of the tools themselves. That is true of fluidisation. There are very many so-called equations of fluidisation which can be applied in limited circumstances with considerable success, but there is no one universal equation of fluidisation as yet, and until such a universal equation or full understanding of the technique is obtained, we cannot apply it to the best advantage.'

There is no doubt in the mind of Professor A. L. Roberts that in due course fluidisation will come to be accepted as an important principle in the gas industry.

(*To be concluded*)

City and Guilds Awards

PRIZE awards have been made by the Council of the Society of British Gas Industries in connection with the recent examinations of the City and Guilds of London Institute. They are as follows:

Gas Technology (Manufacture) (1st prize £2 2s.): H. J. A. Davies (20), student Gas Engineer, Bridgend Technical College.

Gas Technology (Supply) (1st prize equal £2 2s. each): A. T. Goodwin (35), district representative, student of L.C.C. South-East London Technical College, and C. Tennyson (26), draughtsman, student at the Birmingham College of Technology.

Gas Fitting—Intermediate Examination (1st prize, £2 2s.): A. L. May (21), assistant fitter, student of the Southend-on-Sea Municipal College; (2nd prize, £1 1s.): D. J. Clarke (17), apprentice who entered as an external candidate at the L.C.C. Paddington Technical College.

Gas Fitting—Final (1st prize, £3 3s.): D. R. Brown (30), gasfitter, student at L.C.C. Wandsworth Technical College; (2nd prize, £2 2s.): E. W. Packard (19), apprentice student at Sheffield College of Commerce and Technology.

North Wales Juniors' Visit

THE Wales and Monmouthshire Junior Gas Association, North Wales Section, visited the works of the Penmaenmawr undertaking of the Wales Gas Board, on November 19. Before inspecting the works the members heard an informal talk by Mr. Ivor E. Davies, a local historian, on the history of the undertaking.

After the visit a meeting was held in the Grand Hotel, at which the Chairman of the Penmaenmawr Urban District Council, Councillor L. F. Bartle, O.B.E., accorded a civic reception to the Juniors and paid tribute to the way in which the Wales Gas Board had retained the intimate contact between their officials and the local consumer. Replying, Mr. H. Blythe (Colwyn Bay) said he felt there were two beneficial results of such visits. The first was that the Juniors increased their technical knowledge, and the second was that the local manager was proud to feel his works was considered of sufficient interest for a Junior Gas Association to visit.

The paper 'First Aid and Resuscitation in the Gas Industry' was read by Mr. R. H. Hanford of Port Talbot. (An abstract of this paper was published in the 'GAS JOURNAL' of December 2.) This was illustrated with a realistic display by a first aid team comprising employees of the Wales Gas Board.

During a discussion of the paper, Mr. H. Watson of Llangefni asked the best method of applying artificial respiration when the patient had a fractured spine or serious rib injury. Mr. Hanford recommended the Schaeffer method.

Replying to a question by Mr. W. I. Parry of Flint, Mr. Hanford said when a casualty required artificial respiration, and he suffered from heart trouble, the first aid men would not deviate from normal procedure except on instructions from a recognised practitioner. The general priority was in the order, restoration of breathing, stopping of bleeding and treatment for shock. Another questioner who wanted to know the treatment for a man with a crushed foot was told: 'In general the boot is not to be removed as the sole object is "first aid" and only if medical or hospital facilities are not available is anything additional to this attempted.'

ENGINEERS' GUILD

THE President of the Engineers' Guild, Mr. Henry Nimmo, announced at the annual general meeting on December 9 that the Guild now has 3,600 members. The rate of growth had been somewhat higher than in previous years.

He implored engineers, young and old, to join the Guild because, 'We have the means, we have the opportunity of marshalling the strength of the engineering profession and directing these steadfastly and unswervingly to the attainment of our purposes,' he said.

The annual report said that arising out of discussions which had taken place with representatives of the A.A., R.A.C., and R.S.A.C., regarding the part which the professional engineer could take in accident investigation, a detailed memorandum entitled 'A Proposal for a Systematic Accident Investigation' was submitted to the Minister of Transport.

A committee has been appointed to advise on ways and means of helping the older engineers, and at the close of the period under review had already made certain recommendations. As a result there was a meeting with the Professional Engineers Appointments Bureau at which it was agreed that there was valuable work which the Guild could do by fostering a more sympathetic attitude in employers and seeking to explain to them how they might make use of the special abilities of the older engineer, not necessarily by placing him in a recognised vacancy, but by perceiving a 'void' which he might fill.

Heating Community Hall

GAS is to be installed for heating purposes in the first community hall, now nearing completion, in Glenrothes, Fife, one of Scotland's new towns. Sir Garnet Wilson, Chairman of the Glenrothes Development Corporation, made that announcement to the Central District Committee of the Scottish Gas Consultative Council when he was a guest, with Mr. Frank A. B. Preston, General Manager of the Corporation, of the Committee at lunch at Markinch, following a business meeting on December 4.

Mr. A. T. Morrison, Aberdeen, Chairman of the Scottish Gas Consultative Council, presided, and he was accompanied by Bailie S. Leitch, Glasgow, Deputy Chairman. Also present as guests were Provost Bruce, St. Andrews, Convener of Fife County Council, and Mr. A. C. Sheddon, Town Clerk, representing Markinch Town Council.

Sir Garnet told the Committee that the Glenrothes Development Corporation had done its best towards having a favourable balance between gas and electricity in its houses in the new town and had been reasonably successful as far as the 1,000 houses built to date were concerned.

Mr. Morrison said that while many did not seem to realise the Consultative Council had been set up with district committees in different parts of the country for the benefit of Scottish gas consumers, there could be no doubt the Council and subsidiary bodies had fully justified their existence as regards looking after the interests of consumers since the nationalisation of the gas industry.

Members of the Committee were afterwards taken by Sir Garnet Wilson and Mr. Preston on a tour of housing schemes and other developments.

The 1,000th House

THE 1,000th house built in Basildon (Essex) New Town was officially opened on December 2 by Mr. Ernest Marples, Parliamentary Secretary to the Minister of Housing and Local Government. The North Thames Gas Board, in whose area the New Town is situated, has been extremely successful in 'selling' gas for cooking, and has installed cookers in no fewer than 847 of the 1,000 houses let so far.

The house opened by Mr. Marples is 32, Denys Drive, and is occupied by Mr. and Mrs. Andrews and their four children. It is equipped with a 'London' cooker, an Ascot 503/2 sink water heater, and there is a gas burner incorporated in the 'Brook' fire in the living room.

Suitable advertising in the local Press was taken by the Board to coincide with the opening ceremony, pointing out the 84.7% success in the cooking field.

Taunton Sports Club

A SPORTS and social club for the Taunton unit and sub-divisional office staffs of the South Western Gas Board was opened on December 9 by Mr. E. B. Porter, Bath (Deputy Chairman of the Board). The club is the old plating shop of the former Taunton Gas Company, which members have reconstructed and extended in their leisure hours. This voluntary labour was the means of reducing the probable cost from nearly £1,000 to about £150. Besides the club-room and licensed bar, there is a 70 ft. long skittle alley.

The idea of a social club was mooted at the March meeting of the Joint Consultative Committee of the Taunton Sub-division, and, with the encouragement of the Sub-divisional Manager (Mr. T. W. Jackson), the possibilities of finding a suitable site and other facilities were at once explored.

A canvass showed that more than 70 employees were interested in the project and a working committee was elected, with Mr. F. G. Craxford as chairman. Mr. J. Webber drew up plans for converting the old building by voluntary labour at an estimated cost of £150. Membership subscription for the first year was fixed at 26s., payable at 6d. a week, and club rules were approved.

The club now has 126 ordinary members—about 90% of the persons eligible—and employees at other units in the sub-division can use all facilities as hon. members when visiting Taunton.

Mr. E. B. Porter opened the club by throwing the first ball in the skittle alley.

Mr. J. H. Gibbons has recently completed a series of lectures on behalf of R. & A. Main, Ltd., comprising six lectures on the No. 20 'Century' cooker to district and sales personnel in the Watford Division of the Eastern Gas Board, five lectures to the Blyth, Newcastle, and Sunderland Divisions of the Northern Gas Board on both the 'Century' cooker and Thermain No. 15 water heater, and four lectures on the 'Century' to district and sales personnel of the Stockport Division, North Western Gas Board. In the North Eastern area, two lectures were given on behalf of the Leeds Division, to students of the Yorkshire Institute of Housecraft, who are taking a course in institutional management. These lectures dealt with all aspects of kitchen planning and appliance selection.

COMPANY NEWS

CALOR GAS HOLDING

The consolidated trading balance of Calor Gas Holding Co., Ltd., as at July 31, 1953 was £762,143 as compared with £626,115 in the previous year. The dividend remained 32½%. Mr. Barrington C. Cain, Chairman, says the estimated profits for the first three months of the year show an increase over those for 1952. After the dividend and allocations, £30,433 was carried forward.

DANISH GAS COMPANY

The directors of the Danish Gas Company have recommended a dividend of 8% for the year ended June 30, 1953. Net profit was Kr.339,151 (Kr.19.36 = £1), and Kr.46,302 was carried forward. The annual report says that sales of gas during the year showed a very small decrease, but consumption had risen during the past summer and autumn. The general decline in the demand for coke which was a feature of fuel markets last winter had had its effect on the company's operations and was the principal cause of the falling off in revenue.

GAS SUPPLY COMPANY

The Gas Supply Company held its 27th annual general meeting in Melbourne in September. In his address as Chairman, Mr. R. A. Schuchard said the profit for the year ended June 30, 1953, had increased by £10,906 to £46,259. The company had commenced to extend a gas supply to Point Lonsdale, four miles from Queenscliff. This would be a high pressure system, designed similarly to the supply from Albury to Wodonga, which had proved successful. Sales of gas had increased in volume by 3% over the preceding year. It was anticipated that the demand for appliances, gas, and by-products would continue to increase. A final dividend of 3½% made 7% for the year on ordinary stock units.

BENZOL AND BY-PRODUCTS

Liquid resources of Benzol and By-Products will be substantially increased this month when Government stock is received in satisfaction of compensation for coke ovens and by-product plant and houses. The Chairman, Major N. E. Webster, says the directors will take steps to secure the best interest of shareholders by short-term investments of these funds pending their distribution to members on their agreement to liquidate the company. The company's application to the Tribunal established under the Coal Industry Nationalisation Act (for directions for the adjustment of the respective interests of the holders of the £1 preference and the 10s. ordinary shares in the company's assets) is the first to be made to the Tribunal, the chairman adds, and as no precedent exists it is impossible to forecast what course the procedure will take or when the proceedings will be concluded. The Chairman says that the capital and book values of fixed assets remained unchanged at June 30 last.

OXLEY ENGINEERING

At the 17th ordinary general meeting of the Oxley Engineering Co., Ltd., Mr. H. Saville, M.INST.GAS E., Chairman, said that the profit, before taxation, for the 12 months ended June 30, amounted to £114,701 compared with £128,362 for 1952. The profit for the parent company was £89,924 as against £83,357 for the previous year. In his circulated statement, the Chairman said the directors had recommended a dividend of 15%, less tax, plus a 2½% bonus, less tax. The parent company had been very active in supplying constructional engineering and steelplate work to many of the leading gas, oil, and chemical industries in Great Britain and overseas.

Publications Received

It is common practice to refer to atmospheric pressure in terms of inches or millimetres of mercury. It is often necessary to convert these figures into basic units of pressure such as pounds per square inch or per square foot and kilograms per square centimetre. When defining atmospheric pressure in terms of inches or millimetres of mercury, the temperature must be specified, since the height of the column to balance a given pressure varies with temperature.

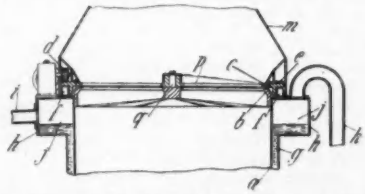
Constable & Co., Ltd., have published 'Tables of Barometric Pressures at Varying Temperatures' by J. D. W. Ball, A.C.G.I. (5s. net). These tables record (1) the equivalents of millimetres of mercury (from 720 to 800) in kilograms per square centimetre, at temperatures varying from 0° to 40°C.; (2) the equivalents of inches of mercury (from 28.5 to 31.5) in pounds per square inch, at temperatures varying from 32° to 104°F.; (3) in. of mercury in pounds per square foot.

Christmas comes but once a year, and when it comes it is not surprising that many housewives are in doubt about how to braise the goose, make the Christmas pudding, or bake the cake. Even the housewife who has cooked the Christmas fare for many years may wish for a few new ideas to go with the traditional. But the lady most likely to be in distress is the 1953 bride. Possibly all she has to help her over her first Christmas is a confusing conglomeration of good advice from mother and mother-in-law, a dozen half remembered recipes from pre-marriage cookery classes, and the frightening vision of a steam-filled house, ruined sloppy messes, and unsuccessful attempts at originality. Or she may obtain the Gas Council's new pamphlet *Party Pieces*. This production has exactly the right light touch, and gives clear instructions on catering for the dinner, tea, supper, cocktail and children's parties.

PATENT

Fuel Feed to Gas Producers

THE object of a patent (No. 695, 682) granted to R. V. Farnham, of Tunbridge Wells, is the provision of fuel-feeding arrangements for gas producers. The aim is to achieve a fuel bed of uniform thickness, and to ensure with an automatic producer fuel-feed in accordance with load demand. The fuel is fed by two plates relatively rotated and having orifices or slots so that uniform depth over the area of the generator is obtained. The accompanying diagram is a vertical sectional view of part of a gas producer embodying the invention.



The usual fuel feed at the top of the producer shell *a* is dispensed with, as is the water jacket at the top of the casing. Instead there is fitted a fixed plate *b* having openings distributed over its area. Above this plate is rotatably mounted a further plate *c* having openings similar to those in the lower plate, the upper plate being rotated by a motor-driven pinion *d* engaging an externally toothed ring *e* on the plate. The plate *c* is mounted on rollers *f* at the periphery.

The upper ends of the water jacket walls *g* of the shell are enlarged in diameter at *h*.

Air is admitted at *i* to the steam space *j* and the air and steam are led by a pipe or pipes *k* to the lower end of the producer into contact with the fuel bed.

Any convenient means are provided to control the speed of rotation of the upper plate in accordance with the quantity of air entering the producer to support the gasification required—*e.g.*, by controlling the speed of the driving motor by hydraulic or other suitable means. The rate of air entry may be controlled as desired to control the rate of gasification. A gas outlet is provided in the wall of the shell beneath the perforated plates.

A shutter is provided which is intermittently operated in accordance with the fuel feed to close and open the feed passage to the hopper *m* so as to prevent loss of gas.

The fuel is supplied continuously by way of a hopper *m* so as to rest upon the plate *c* which is conveniently rotated at, say, 4 R.P.M.

The effective area and distribution of the openings in the plates is such that the fuel falls through to form a bed of fuel of substantially uniform depth throughout the whole internal cross-sectional area of the producer shell *a*. Uniform quality of producer gas results while the thickness and density of the fuel bed are maintained substantially constant irrespective of load demand on the producer.

The Outstanding Success of the recent national fuel efficiency exhibition in Manchester, at which the gas industry was a prominent exhibitor, is likely to lead to similar exhibitions at regular intervals, the North West Regional Board for Industry was told by Mr. W. D'Arcy Madden, the Chairman. 'We are informed that in future it will probably be a periodical event, repeated every two or three years,' he told the Board.

Trade News

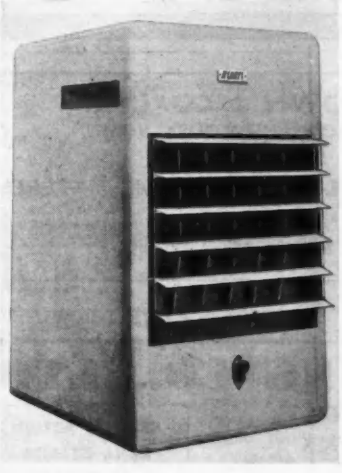
Tar De-Watering

During the war when the processing of highly sensitive explosive materials became a problem of paramount importance, the whole technique of sieving and grading had to be reviewed. Research led to the conclusion that the sieving effect would have to be brought about by a rotative or cyclic motion rather than a reciprocating one and it was postulated that, provided a rotary movement of sufficiently small amplitude could be employed, the centrifugal forces involved would not be powerful enough to produce any ill-effects. The solution of this problem was eventually achieved by the application of a gyratory motion in a horizontal plane to the screening surface. This type of equipment has found a wide range of application in industry, and recently the separator has been successfully applied to the de-watering of tar. It has been found that the separator has the ability to strain this material through very fine mesh, thus separating out the solid material, and incidentally partially breaking down the emulsion; with the result that the tar thus processed can be readily de-watered by centrifuging.—*Russell Constructions, Ltd., Russell House, Adam Street, Adelphi, London, W.C.2.*

Gas-Fired Air Heaters

Harris Engineering Co., Ltd., are now manufacturing and marketing a new range of flued gas-fired air heaters of modern design and high efficiency.

The unit heaters (see illustration) are available in three sizes, with outputs of 50,000, 100,000 and 140,000 B.Th.U. per hour. They are completely automatic, each unit incorporating gas governor, magnetic valve, pilot safety control, overheat cut-out, and thermostatic control. A variation from the standard design allows the use of a special centrifugal blower in place of the standard propeller fan, thereby making the unit suitable for use with outlet ducting (and also fresh air intake ducting if required).



The vertical cabinet heaters also include full automatic control and incorporate the special centrifugal blower. These heaters normally have the warm air outlet in the top, but other types of outlet can be fitted, or the heater can be connected to ductwork.

Larger floor type heaters, with outputs ranging from 400,000 to 1,500,000 B.Th.U. per hour are also being manufactured against specific requirements.

Full details of all these heaters, and of the range of flueless heaters are available from *Harris Engineering Co., Ltd., York Works, Browning Street, London, S.E.17 (Tel. RODney 3835/6/7).*

Ram Units

Chamberlain Industries, Ltd., have introduced a complete new range of high pressure double acting hydraulic cylinders from 5 to 50 tons capacity. These cylinders are streamlined in appearance and the clean design, eliminating projecting tie-rods and end caps, saves up to 33⅓% installation space and at the same time permits the installation of the maximum powered cylinder for the job. The rear housing is suitable for trunnion mounting and is particularly suited for installation in machinery or plant where only slight movement of the ram is necessary in operation. The cylinders are manufactured from smooth bore solid-drawn hydraulic tubing and the rams of high quality steel of adequate strength and proportion to give trouble-free service. Twin chevron packings and 'O' type seals are used to ensure maximum efficiency and freedom from leaks, and adequate bearing service is provided to give maximum support to the ram when extended to its fullest position.

The maximum working pressure is 5,000 lb. per sq. in. and ¾-in. B.S.P. tapped holes are provided in the caps at either end for connection purposes.

In addition, the manufacturers provide a comprehensive range of both single and double acting hand-operated and motorised pumps for working pressure up to 6,700 lb. per sq. in.—*Chamberlain Industries, Ltd., Staffa Works, Staffa Road, Leyton, E.10.*

Drying Problems

'Have You a Drying Problem' is the title of a leaflet, published by Thomas De La Rue and Co., Ltd., which sets out in attractive form the principle of bringing radiant heat to the production line—wherever the drying of mechanical parts and units has to be carried out. The leaflet describes the advantages of the use of individual radiant panels. With such units tunnels may be built to almost any shape or size to suit the process involved, distribution of heat is easily controlled, and panels may be added to an existing tunnel to increase the speed of the production line without the necessity for a complete shut-down. Tunnels can be adapted to suit existing factory layout—and they need not be floor-based. Generally speaking, the position and track of a tunnel are governed only by the flexibility of the conveyor system used.

Re-seating Tool

Abbott, Birks & Co., Ltd., have brought out a new re-seating tool for Ascot R/12 and R/52 heaters. The cutter instead of having radial teeth, as is usual with re-seating tools, which are liable to chatter in use causing an uneven seat, has parallel teeth. Though this means that some of the teeth are not operative throughout the cutting motion, an extremely smooth seat is produced with a minimum removal of metal.—*Abbott, Birks & Co., Ltd., 90, Blackfriars Road, London, S.E.1.*

In the JOURNAL for December 2, p. 619, the Wynip self-gripping hook was incorrectly positioned in the illustration. The correct position is as above.

Interviewing

OVER the past few years a number of experimental studies have tended to throw doubt on the validity and reliability of the average employment interview as a technique of assessment. AS MR. HAROLD F. LOCK points out in the National Institute of Industrial Psychology paper, *Interviewing for Selection* (N.I.I.P. Paper No. 3, price 2s. 6d.), however, the fact remains that in the normal circumstances of industry and commerce the interview is usually the main means of assessment, and often the only one. It is, therefore, a matter of considerable practical importance that it should be done well. It is first of all necessary that, without being too rigid, the interviewer should work with a system in mind; a system which will enable him to marshal his information to the best effect. The paper suggests the use of the Institute's now widely known Seven Point Plan for this purpose. It is pointed out that evidence about the candidate can be secured, during the interview, from several sources. It is necessary, it is suggested, to cover the family and home background of the candidate; his schooling; his further education and technical training; his work history and service record, if any; his interests; and his present circumstances. The paper discusses the contribution that can be expected from each of the sources. It then goes on to consider the methods of the interviewer. After reviewing in some detail the proper setting for the employment interview the author discusses its structure and conduct, with a number of practical suggestions on such points as the establishment of satisfactory 'rapport,' the unobtrusive but effective control of the situation by the interviewer, the taking of notes, the avoidance of the 'halo' effect, and so on.

Illustrated is the 200 c. ft. Dry Demonstration Meter in tinplate case.

IMPORTANT MEASURES

The 'A & M' DRY DEMONSTRATION METER

This meter is particularly useful for cookery or other demonstration purposes. The dial is 9" in diameter, and the meter is available in a variety of sizes. Complete details will be sent on request.

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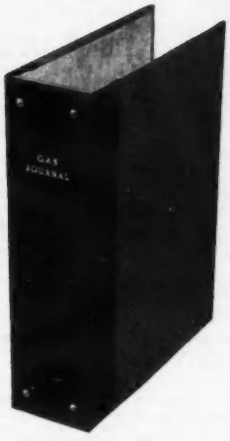

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SPECIALLY ACTIVATED OXIDE OF IRON

Oxide supplied on loan or sale outright.
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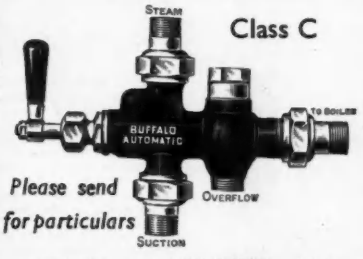

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RUBBER MOPS

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For resale to the public, and in bulk for Works use.

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7, CROMPTON WAY, CRAWLEY, SUSSEX.

APPOINTMENTS VACANT

The engagement of persons answering these advertisements must be made through a Local Office of the Ministry of Labour or a Scheduled Employment Agency if the applicant is a man aged 18-64 inclusive or a woman aged 18-59 inclusive unless he or she, or the employment, is excepted from the provisions of the Notification of Vacancies Order, 1952.

ASSISTANT SALES REPRESENTATIVE for the London and South Eastern areas required by old established firm of appliance manufacturers and engineers. Applicants must not be more than 25 years of age, and whilst technical knowledge is desirable, it is not essential, as training will be given. Applications should contain full details as to education, personal background and salary required together with all other relevant details, which will be treated as a matter of strict confidence. Apply: No. 174, *Gas Journal*, 11, Bolt Court, Fleet Street, London, E.C.4.

SOUTH WESTERN GAS BOARD

APPOINTMENT OF

DEPUTY SECRETARY AND SOLICITOR

APPLICATIONS are invited for the appointment of DEPUTY SECRETARY AND SOLICITOR from Solicitors with considerable experience of the Legal and Administrative work of a large Organisation. Previous experience in the Gas Industry is desirable, though not essential.

The salary for the appointment will be £1,500 rising by annual increments of £100 to £1,800 per annum and the commencing salary will be within this range, depending upon the qualifications and experience of the person appointed.

The successful applicant will be required to pass a medical examination and to join the Board's Staff Pension Scheme.

Applications stating age, qualifications, experience, period of notice required for terminating present appointment and giving the names of two persons to whom reference can be made, should be received by the undersigned not later than Thursday, December 31, 1953.

W. N. CURTIS,
Secretary and Solicitor.

Area Headquarters,
9a, Quiet Street,
Bath.
December 8, 1953.

(*Classified Advertisements continued on page* 802)

APPOINTMENTS VACANT (ctd.)

APPLICATIONS are invited for the position of SALES REPRESENTATIVE to the North Eastern and Northern Area Gas Boards, on behalf of an old established Company of appliance manufacturers and engineers. Remuneration will be by salary, commission, plus expenses. Applicants must be Salesmen; car owners, preferably domiciled in the area of the Northern Gas Board, and not over 40 years of age. The fullest details, which will be treated as a matter of strict confidence, are invited. Apply: No. 175, *Gas Journal*, 11, Bolt Court, Fleet Street, London, E.C.4.

DRAUGHTSMAN
(SENIOR)

age over 30, required for large constructional engineering company in the Midlands. Wide gas holder and plate-work experience essential. Good opening for right man. Pension scheme.

Write, in confidence, stating age, experience, qualifications and salary required to: Personnel Manager, Box 397, 19/21, Corporation Street, Birmingham, 2.

APPLICATIONS are invited for the position of WORKS MANAGER AND ENGINEER at Calcutta Gasworks. Capacity 4½ million cu. ft. per day.

Applicants must have had considerable experience in both the manufacture and distribution of gas. A first-class knowledge and experience of horizontal carbonisation is also essential.

Salary between the equivalent of £2,250-£2,700 per annum, according to qualifications, plus dearness allowance, both subject to Income Tax.

Free furnished quarters provided, together with car.
Provident fund in operation.
Passages paid out and home.
Contract in first instance for three years.
Strict medical examination necessary.

Applications stating age, experience, qualifications and whether married or single to be submitted by January 15, 1954, to:—

Agent in London,
The Oriental Gas Co., Ltd.,
Broad Street House,
54, Old Broad Street,
London, E.C.2.

WALES GAS BOARD
NEATH UNDERTAKING
ASSISTANT ENGINEER & MANAGER

APPLICATIONS are invited for the appointment of ASSISTANT ENGINEER & MANAGER to the Neath Undertaking, which has an annual output at present of approximately 850 million cu. ft.

The successful applicant will be responsible for the efficient operation of the works, and will assist in the supervision of the Distribution Department. He will also perform such administrative duties as are normally associated with an Assistant Engineer and Manager of a Gas Undertaking, and in the absence of the Engineer and Manager will be responsible for the management of the Undertaking.

Applicants must be chartered Gas Engineers and should possess qualifications in both Manufacture and Distribution. Experience with Continuous Vertical Retorts and Carburetted Water Gas Plant and a knowledge of high pressure Distribution is very desirable.

Salary will be in accordance with Grade XII of the Scale of Salaries for Gas Staffs (£740/£865 per annum). A house in a residential area will be available at a suitable rental.

The appointment is subject to a satisfactory medical examination and to membership of the Board's Superannuation Scheme.

Applications, giving age, details of qualifications and experience, and the names of two referees should be submitted to the undersigned so as to be received not later than December 31, 1953.

G. FITTON,
Engineer and Manager.

Gas Works,
Millands,
Neath.

SOUTH EASTERN GAS BOARD
DESIGN DRAUGHTSMEN,
CENTRAL CONSTRUCTION DEPARTMENT,
OLD KENT ROAD, S.E.15.

APPLICATIONS are invited from DESIGN DRAUGHTSMEN for vacancies in the Central Construction Department of the Board.

Applicants should have a sound engineering training and have experience in the design and construction in any of the following branches of work:—Coal Carbonising and Gasification Plant, By-Product Plant, Materials Handling Plant, Reinforced Concrete Structures, Structural Steelwork and Steam and Power Plant.

Salary within the ranges £615-£695 per annum or £645-£745 per annum according to qualifications and experience.

Applications, quoting reference V10/378 and giving full details, should reach the undersigned not later than fourteen days after the publication of this notice.

R. J. MCCRAE,
Personnel Manager.

Katharine Street,
Croydon.

EASTERN GAS BOARD
CAMBRIDGE DIVISION
ACCOUNTANCY ASSISTANT—
CAMBRIDGE DISTRICT

APPLICATIONS are invited for the position of ACCOUNTANCY ASSISTANT at Cambridge District.

Preference will be given to applicants holding an accounting qualification and having experience of accounting duties in the Gas Industry.

The salary will be within the range of A.P.T. Grade VII, Provincial 'A' of the salary scales of the National Joint Council for Gas Staffs (£545-£625 per annum).

The successful applicant will be required to pass a medical examination and to become a member of the Eastern Gas Board Staff Pension Scheme.

Applications stating age, qualifications and experience should be forwarded to the undersigned within seven days of the appearance of this advertisement.

J. HUNTER-RIOCH,
General Manager.

52, Sidney Street,
Cambridge.

EASTERN GAS BOARD
TOTTENHAM DIVISION
ENGINEERING DEPARTMENT
TECHNICAL ASSISTANT—
SOUTHGATE WORKS

APPLICATIONS are invited to fill the vacancy of TECHNICAL ASSISTANT at Southgate Works.

Applicants should have obtained the Institution of Gas Engineers' Higher Grade Certificate in Gas Manufacture or have equivalent qualifications and be experienced in the operation of horizontal retorts, water gas manufacture, water treatment, and all purification processes. Applicants should also have a knowledge of laboratory work and be prepared to control a small laboratory staff.

The successful applicant will be required to pass a medical examination and to contribute to the Board's Staff Pension Scheme.

The salary will be in accordance with Grade VIII Metropolitan (£615/£695) of the National Salary Scales for Administrative, Professional and Technical Staffs.

Applications, stating age, experience and qualifications, should be addressed to the Divisional Personnel Manager, Woodall House, 658, Lordship Lane, London, N.22, to arrive not later than Thursday, December 31, 1953.

December 7, 1953.

WEST MIDLANDS GAS BOARD
WORCESTERSHIRE-HEREFORDSHIRE
DIVISION
VACANCIES FOR
TECHNICAL ASSISTANTS

APPLICATIONS are invited for the above positions on the Divisional staff and at various Undertakings in the Division.

Candidates should have received a good general training in Gas Manufacture and be capable of carrying out routine chemical tests and have experience in the control of plant.

Preference will be given to applicants holding a Certificate of the Institution of Gas Engineers in Gas Engineering (Manufacture).

The salaries for the posts will be within Grade V (£460-£540 per annum) of the National Salary Scales for Gas Staffs.

The posts are pensionable and the successful candidates will be required to pass a medical examination.

Applications stating age, qualifications and experience, together with the names of two referees, should be addressed to Mr. C. F. W. Rendle, Divisional General Manager, West Midlands Gas Board, Worcestershire-Herefordshire Division, 12, St. Nicholas Street, Worcester, to reach him within fifteen days of the appearance of this advertisement.

F. H. CURETON,
Secretary to the Board.

PLANT FOR SALE

FOR SALE:—Pressure gauges in moulded plastic. Unspillable, unbreakable—almost unbreakable. A great advance. Write: G.J., Combustion Instruments, BCM/COMB, 106, Kensington High St., W.8.

TWO—Induced draught type waste HEAT BOILERS and SUPERHEATERS by SPENCER BONECOURT, LTD., 18ft. 0in. over tube plates × 6ft. 6in. diameter, evap. 6,000 lbs./hr. at 120 p.s.i. Final steam temp. 400°F. One boiler new 1926, retubed 1948; other new 1929, retubed 1946; both complete with fittings, valves and pipework to the outlet of superheaters. One boiler only fitted with induced draught fan by Greenwood and Batley 37 b.h.p. turbine.

These boilers are at present lying at the Aylestone Road Works, Leicester, of the East Midlands Gas Board and may be inspected during normal day work hours.

NEWRY URBAN DISTRICT COUNCIL
GAS DEPARTMENT
DISPOSAL OF
REDUNDANT LIGHTING EQUIPMENT

SENDERS are invited for the sale of the above equipment which includes Cast Iron Columns, Lantern Heads, Clock Controllers, etc.

Form of Tender and Specification can be obtained on application to the Gas Offices, Kilmorey Street, Newry, Co. Down N.I.

Tenders to be submitted not later than 12 o'clock noon on Thursday, January 7, 1954.

M. MAGUIRE,
Secretary.

CONTRACTS OPEN

URBAN DISTRICT COUNCIL OF NEWRY
GAS DEPARTMENT
TENDERS FOR SUPPLIES

THE GAS COMMITTEE of the above Council invites Tenders for the supply and delivery of Galvanised Tubing and Fittings, Brass Tubing and Fittings, Lead Compo Pipe, Copper Tubing and Fittings, Sundry Hardware and other Requisites, during the period ending June 30, 1954.

Itemised Schedule of Materials and Form of Tender can be obtained on application, from the Gas Works, Newry.

Sealed Tenders, endorsed 'General Supplies' will be received by the undersigned up to 12 o'clock noon on Saturday, January 16, 1954.

M. MAGUIRE,
Secretary.

SCRAP GAS METERS WANTED!
A SPEEDY SERVICE
Sell to those best suited to deal with them.
TOP PRICES PAID
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ON GASWORKS

for the regular purging of purifiers, for repairs to gas holders and other gas works plant this Holmes unit will supply Inert Gas with economy and efficiency ensuring safety both to plant and personnel.

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industrial gas compressors

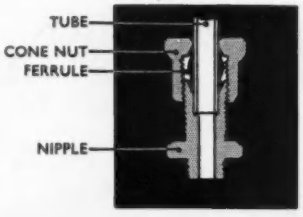
FOR COMPRESSING AIR OR GAS SUPPLIES USED FOR FURNACE HEATING, METAL MELTING, BRAZING, SOLDERING BITS, LAUNDRY IRONS, ETC.

DIRECT COUPLED COMPRESSORS (see illustration right) are fitted with automatic internal by-pass valves and lubrication systems. They are direct coupled to Keith Blackman motors. Type OA compressors in this range occupy a floor space of only 18" x 7½".
CAPACITY RANGE: 100 to 750 cub. ft. of gas or air per hour at 3 lbs. per sq. in. pressure.

TYPE 4 COMPRESSORS (not illustrated) are also fitted with automatic internal by-pass valves and lubricators. The complete unit includes motor and drive on a common bedplate, all of Keith Blackman manufacture.
CAPACITY RANGE: 500 to 20,000 cub. ft. of gas or air per hour at 3-5 lbs. per sq. in. pressure.
AREA OCCUPIED: from 9¼" x 16½" to 61" x 27".

DID YOU KNOW?

KEITH BLACKMAN have been making compression joints for many years and the present design embodies features developed as a result of this long experience. Notice that the shape of the ferrule is such that the joint is made without unduly stressing the tube.



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Note: the four burner heads (right) are for high pressure gas, or low pressure gas and air blast.

LEFT: "Fishtail" type burner with two-armed stamped pattern injector for heating liquid in tanks by submerged combustion tubes. For use with low pressure gas supplies.
Size Range: 1", 1¼", 1½", 2" and 2½" outlets.
Capacity Range: 45-280 cub. ft. of gas per hour.

Brass non-blow-off head types: deal with 5 to 10 cub. ft. of gas per hour.

Stainless steel, "F" type head, burner: deals with 8 cub. ft. of gas per hour.

Perforated head type burner: deals with 10 to 15 cub. ft. of gas per hour.

INDUSTRIAL GAS EQUIPMENT

524

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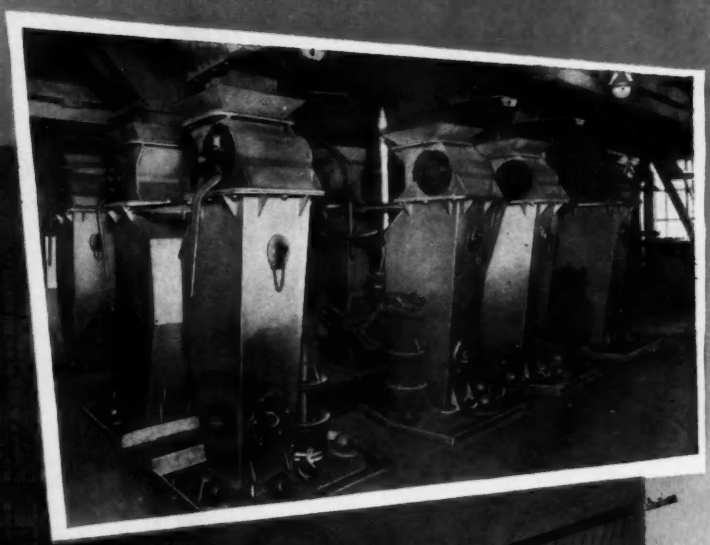
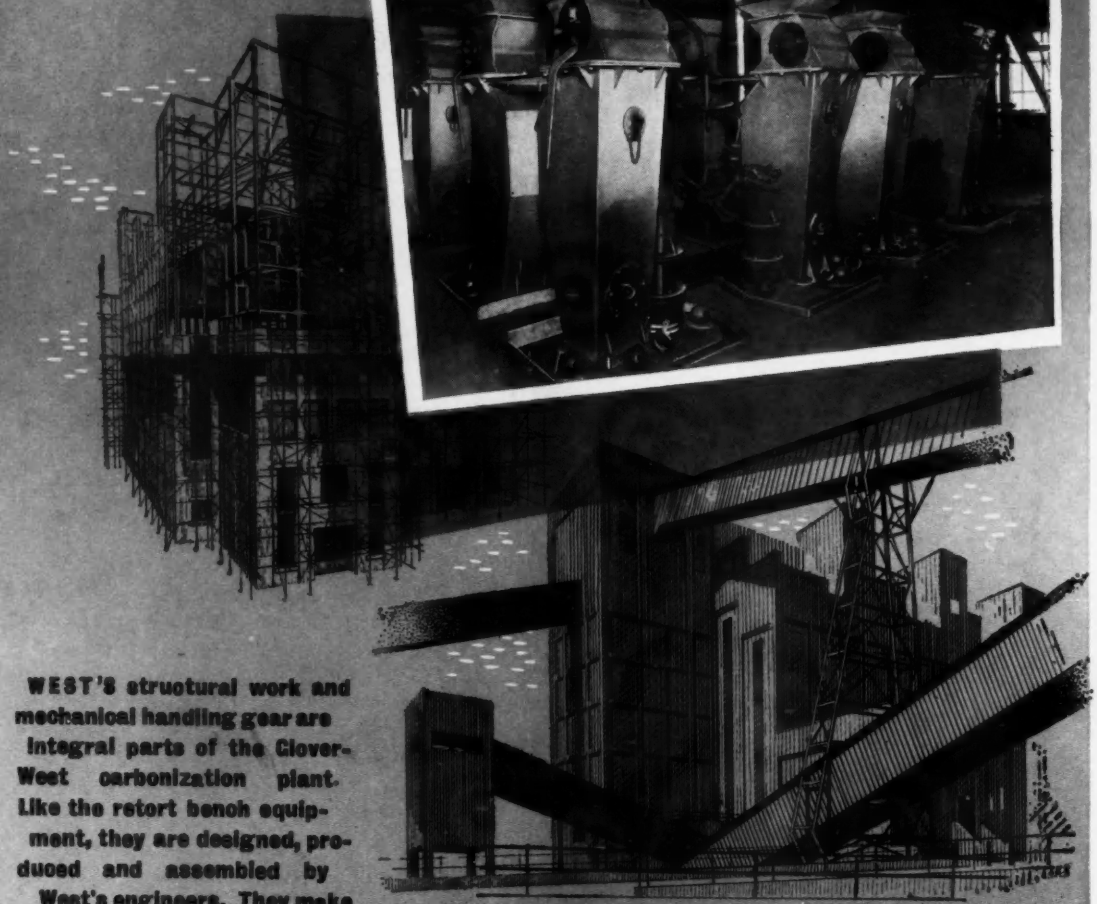
Behind the Retorts





WEST'S structural work and mechanical handling gear are integral parts of the Glover-West carbonization plant. Like the retort bench equipment, they are designed, produced and assembled by West's engineers. They make an important contribution to the efficiency of the system. In addition, they provide practical evidence of the availability to the gas industry of an experienced service in the structural and mechanical handling fields.

WEST'S GAS IMPROVEMENT CO. LTD

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gives an ample flow of

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No other appliance and no other fuel gives this service.
When you sell an instantaneous water heater you sell the advantages of **gas!**

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Only Ascot Instantaneous Gas Water Heaters are fitted with Stainless Steel Burners — which have cut maintenance costs.

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